

THE RAILWAY GAZETTE
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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE in that the size of the page has been reduced from 9 in. x 12 in. to 8½ in. x 11½ in. The type area of the page remains the same, namely, 7 in. x 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:

Mondays to Fridays 9.30 a.m. till 5.30 p.m.

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

The Railway Agreement and E.P.T.

THE current issue of *The Railway Stockholder*, issued by the British Railway Stockholders Union, points out that in the discussion of the second railway financial agreement, the question of Excess Profits Tax continually arises. If the earnings of the railway companies for 1938, or the "bases years" 1935-37, were taken for calculating the obligation of the railway companies for E.P.T., then the stockholders, it is conceded, would suffer by comparison with the rental received under the second agreement. On the other hand, it is argued that the railways have a good case for a substituted profits standard, for which provision was made in the Finance Act, 1941, and that this would provide an upward limit of 6 per cent. on the capital employed. The years between 1930 and 1938 were depressed years for the railway companies, and the Excess Profits Tax legislation has provided for adjustments necessary in such cases. Stockholders in British railways cannot reasonably ask for any higher net income during the war than other industrial concerns doing war work; but they can justly ask that holders of ordinary stock should have the protection accorded to all depressed industries. The union holds that a "fair standard profit" has been laid down by Parliament itself in the Railways Act, 1921, when provision was made for the standard revenue.

A New Government for Argentina

Apparently with the minimum of disturbance, the Castillo regime in Argentina was overthrown on June 4, and a military triumvirate set up under the presidency of General Arturo Rawson. The proclamation issued by General Rawson contained condemnation of "usurious capital" and "communism" equally, but there is held to be ground for the belief that ultimately the change in Government should secure more sympathetic consideration of the claims of the railways and other British-owned undertakings in Argentine to equitable treatment. In any event it is assumed that the new Government is pro-Ally and anti-Axis and closer political ties may be followed by improved financial and economic relations. Whether the new administration will prove more sympathetic to the representations which have been made on several occasions by the British-owned railways for a more favourable rate of exchange cannot be guessed, but these and other matters related to the employment of foreign capital in furthering the Argentine economy will no doubt be raised with the ministers of the regime when it has had time to become established. On June 7 General Rawson resigned the Presidency in favour of General Ramirez, who is stated to favour a strictly neutral policy.

Hired Motorcar Evasions Stopped

Under the arrangements which applied up to Monday last, it was possible to secure the use of a motorcar for many purposes for which fuel would not be granted, if the car were hired without a driver. The self-drive car has been used widely for pleasure purposes, with the hirer having a car at his free disposal, without the restraint of the presence of a driver, and for practical purposes the self-drive car was a private car during the time of such hire. The new Order has eliminated this, even within the inner radius of 10 miles from the garage, but there is still no restriction on the journeys made within this radius, if both car and driver are hired, as with a taxi. However, the continuous hire of a car to one person (or to members of his household, or partners and employees) has been prohibited, as detailed at page 594. Among other things, this regulation is designed to cope with the person who has been refused petrol by the Regional Petroleum Officer, and then has sold his car for a nominal sum to a hire-car proprietor, who hires it back continuously for a nominal payment. There have been some hire-car businesses maintained for the primary purpose of securing the increased petrol allowances granted to such undertakings, which have used the whole of such petrol for virtually private purposes.

Railway Interests in Road Transport

The financial interest which the four main-line railway companies have taken in the road industry in recent years normally would be considered very substantial, but viewed in its due proportion to railway capital and earnings appears in a somewhat different perspective. That it is a very remunerative branch of the railways' business cannot be denied. Rather more than £20,000,000 of railway capital is invested in road transport; that is about 0.5 per cent. of railway capital receipts of £1,100,000,000. On page 581 we give details of railway holdings in passenger road transport companies, and the earning on the capital employed. These show that the companies have invested

just over £9½ millions in associated bus companies. The balance of the £20,000,000 is made up of investments in goods hauliers, railway-owned parcels and goods road vehicles, and garages and stables. On the £9½ millions invested in road passenger transport, earnings amounted to over £1,300,000, or more than 13 per cent., which compares with an average return of about 3½ per cent. on the total railway capital. This disparity in yield shows in part the advantage of road operation on a free track, maintained and signalled at the public expense! The £1,300,000 compares with a total net revenue of the four main-line railways of about £37,000,000 in the years just before the war, and of £38,164,000 under the financial agreement with the Government. The purpose of these comparisons is not to belittle the importance of railway road interests but to show them in relation to railways as a whole—a perspective which is sometimes lost.

The Baker Valve Gear

To engineers in other branches of mechanical engineering, progress in the application of new ideas to locomotives often seems slow. Sometimes locomotive engineers themselves are puzzled by the apparent sluggishness with which practice avails itself of fresh possibilities for improvement. The Walschaerts valve gear was originated before 1850, yet only 20, to 30 years ago its application outside European countries was still on a very limited scale, a fact noticed and deplored by at least one American authority. In recent years this gear has become the rule rather than the exception and now, nearly 100 years after it first became available, its merits are widely recognised. Between the very gradual adoption of the Walschaerts gear and the equally gradual adoption of the Baker gear there would seem to be a historical parallel. The Baker gear was brought to a practical form in 1910, and is now used on 15,000 locomotives in the country of its origin but hardly at all elsewhere. The present position in relation to this gear is difficult to explain unless we accept the view that locomotive engineering is still "hastening slowly." If the gear is inferior to the Walschaerts it should have disappeared with many other experimental gears long ago, but if it is markedly superior then it should, one would think, have come by this time into much more general use. On pages 586-7 of this issue we publish diagrams showing some recent applications of the Baker gear.

Overseas Railway Traffics

Prices of Argentine railway debenture issues have been influenced adversely by the proposed extension of the Buenos Ayres Western moratorium, an influence not materially checked by the announcement of a substantial payment of arrears on Central Argentine 4 per cents. Traffics of the Central Argentine for the 47th and 48th weeks of the financial year show an advance of £15,114, and the corresponding advance on the Buenos Ayres Great Southern is £35,160. The decreases of £4,560 and £7,800 shown for the fortnight by the Buenos Ayres & Pacific and the Buenos Ayres Western respectively go against increases in the comparative period of 1942. On the Brazilian railways there is a general improvement in receipts. For the period January 1 to May 29, 1943, the Great Western of Brazil is £119,300 up and the Leopoldina is £61,024 up.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
Buenos Ayres & Pacific*	48th	92,040	- 2,460	4,786,680	+ 576,420
Buenos Ayres Great Southern*	48th	148,740	+ 7,860	7,724,820	+ 686,160
Buenos Ayres Western*	48th	48,780	- 8,940	2,594,520	+ 118,860
Central Argentine*	48th	123,660	+ 8,244	6,295,668	+ 1,235,226
Canadian Pacific	20th	1,120,000	+ 128,000	20,659,600	+ 2,039,800

* Pesos converted at 16½ to £.

Aggregate gross earnings of the Canadian Pacific Railway from January 1 to April 30, 1943, amounted to £17,465,800, an increase of £1,812,600 on the corresponding period of 1942, but the aggregate net earnings of £2,493,600 showed a decrease of £214,400.

The Royal Train in Wartime

Since the outbreak of war the King has made 252 journeys by railway in Great Britain, covering 36,000 miles, and has thus seen more of the country at war than most persons. The Royal Train has been a vital factor in enabling the King to fulfil his heavy engagements with the least possible waste of time and energy. The present royal carriages were constructed by the L.M.S.R., and are planned to give simple but comfortable accommodation for Their Majesties for both day and night travel. The arrangements make it possible for the King to attend to affairs of State while in the train. One of his private secretaries always travels with him, and the train is equipped with telephones which enable the King to keep in direct touch

with London. The train is used as the royal headquarters during tours lasting several days and covering widely scattered places. A senior railway operating officer, in charge of the train on its journeys, adjusts the working to meet unforeseen circumstances. On one occasion in the depth of winter, with two feet of snow on the ground, an air raid developed, and it was necessary to run the train into the shelter of a nearby tunnel. The chief dining car attendant, and the head carriage inspector, both of whom have travelled with royal trains for over thirty years, were recently decorated with the Royal Victorian Medal.

Wartime Travel "Luxury"

A war aim of some of the most vocal of our politicians today would appear to be the infliction of maximum discomfort on various sections of the community, with the intention, no doubt, that this vicarious suffering shall greatly aid the prosecution of the war. Recently a question in Parliament brought to light the existence of a secret "luxury train," figuring in no public timetable and yet run daily for over 400 miles in each direction. With a pertinacity rivalling that of Sherlock Holmes, the questioner had ferreted out the precise composition and weight of this express, and the particularly iniquitous fact that included in its composition there were no fewer than five first class sleeping cars, with berths for 60 sybarites who doubtless procured this entirely unauthorised travel luxury "under the counter," so to speak. The facts, however, put rather a different complexion on the case. Night traffic between London and Glasgow, entirely concentrated on the L.M.S.R., and consisting in by far the major proportion of Servicemen, is so heavy that the 9.15 and 9.20 a.m. expresses from Euston, and the 9.10 and 9.30 p.m. from Glasgow Central, have been unable to handle it without overloading the trains or overcrowding the passengers. A relief express has therefore been running from Euston at 8.40 p.m. to Kilmarnock and Glasgow, and similarly at 9.27 p.m. from Glasgow (St. Enoch), almost exclusively in the interests of the Services. By the provision of adequate sleeping accommodation, which was not possible on the advertised trains, officers who have to put in full days of work on arrival have thus been enabled to get a decent night's rest, which, we should imagine, should benefit rather than hamper the war effort.

Keeping Derailed Vehicles in Line

Even a railway accident is not without its ultimate value if it teaches clear lessons as to methods which can be taken to assure future safety and if these methods are capable of reasonably simple application. On p. 583 a description is given of the derailment by sabotage of the well-known City of San Francisco streamliner in Nevada in 1939, and of the way in which the holding to the track of the leading power car led to the evolution by Southern Pacific Railroad officials of a very simple device, known as the "derailment safety-guide," which is designed to keep derailed bogies in line with the track. Apart from some deliberate derailing tests, the safety-guide has already proved its efficacy in several derailments, certain of which might have proved disastrous but for the efficacy of this ingenious invention. It is, in brief, an attachment to the underside of the bogie frame with vertical flanges which engage the rail-head after derailment, so that the guide itself, carrying the weight of the car, skids along the rails until the train is brought to rest. In this way the bogies are prevented from taking the angular position which so easily causes them to slue out of line, and can result in vehicles taking angular positions all over the track, with much resultant damage. Probably this type of safety-guide would prove more effective with flat-bottom than with bull-head track, for the flat-bottom rail presents a smooth surface longitudinally from head to foot, whereas with the bull-head rail there is the periodic obstruction of the chair, the jaw and key of which rise from the sleepers to not far short of rail level.

Railways and Manpower Problem

In time of war the need for men is so great that the requirements of the fighting forces sometimes come into direct conflict with those of industry and transportation. Measures were taken at the beginning of the present conflict to prevent the army from making manpower demands that would immediately cripple the essential services, but many classes have been dereserved since. The process of building up military might has now reached a stage where it needs expert knowledge to judge whether further gains in military resources would not be negatively by a loss in industrial productivity and in such mobility of men and materials as efficient transport can provide. Our American allies are asking whether there is not already "too

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much army"; an article in our contemporary, the *Railway Mechanical Engineer*, suggests that the capacity of the railways to meet present needs will suffer serious diminution if adequate staff is not left to operate and maintain them efficiently. British railways have felt the lack of men longer and to a greater extent than American ones; and in addition their remaining employees have to devote time and energy to Civil Defence and Home Guard duties.

The Stover Canal

It may be recalled that a special meeting of G.W.R. stockholders last March authorised an application to the Minister of War Transport for a warrant under Section 45 of the Railway & Canal Traffic Act, 1888, to abandon the Stover Canal and to release the G.W.R. from liability to maintain it. This canal, which is stated to have been "executed under the direction of Mr. Gray of Exeter in 1792," is about 1½ miles long and extends from a junction with the River Teign, near Jetty Marsh, to Ventiford, a short distance to the north of where Teigngrace Station now is. It was built without Parliamentary powers, and in 1820 was extended by a tramroad with granite rails to the Hay Tor Quarries, Dartmoor. Tramroad and canal conveyed much heavy traffic in early days, including granite for London Bridge, the National Gallery, and the old General Post Office. The undertaking became the property of the Duke of Somerset in 1829, and part of the tramroad, which fell into disuse about 1858, was used in building the Moretonhampstead & South Devon Railway, opened on July 4, 1866. This railway, by agreement, took over the Stover Canal in 1864. The canal was leased to Watts, Blake, Bearn & Company for 21 years from September 29, 1893, at an annual rental of £200, and the lease was further extended (by two periods of 14 years) to 1942. Traffic ceased in 1938.

Track Circuiting Helping the War Effort

Consideration of the various signalling schemes that have been designed in connection with works undertaken to assist in facilitating wartime traffic shows how much track circuit aids the signal engineer in giving the maximum flexibility and operating advantage with a minimum demand on the provision of signalmen. It is interesting to think of what would have been involved in providing these facilities in earlier times before it was customary to use track circuits so readily. Many more signal boxes would have been required, with staff, to man them, and the difficulties of working in foggy weather much increased. It is not surprising that the wish to use, or necessity of using, steel or concrete sleepers is causing the signal engineer some concern. Nobody has yet found a complete equivalent for track circuit of general application, although some success has attended the use of alternatives in favourable circumstances. Plenty of ingenuity, however, has been expended on the problem. Track circuit remains the basis of our modern work, and although other improvements have their part in the picture, it is the track circuit which enables their full benefits to be obtained.

A Locomotive Designed for Many Railways

Full details are now available of the first articulated locomotive to be built to the order of the Ministry of Supply specifically for the War Department to help in meeting the great demand on transport which has arisen as a result of the war. On another page we give illustrated details of this engine, a heavy freight Beyer-Garratt locomotive, which has many interesting features. Not the least is that it is in effect a universal 60-lb. rail 3 ft. 6 in.-gauge engine, and that it will be able to operate over all the 3 ft. 6 in.-gauge lines of British, French, and Belgian territory in Africa. These locomotives will be suitable for use on 75 per cent. of the total 3 ft. 6 in. mileage on this continent. The principal lines in Africa built to the 3 ft. 6 in.-gauge and laid with 60-lb. rail, include the following:—

Matadi-Léopoldville	Gold Coast
Katanga	Rhodesia
Congo Ocean	South Africa
Nigeria	Nyasaland
Sierra Leone Development Co. Ltd.	Sudan

The heavy grades and numerous and sharp curves on many of these railways, and their long mileages of single line, require the heaviest possible train loads. The high tractive effort, large boiler, wheel arrangement, and coupled-wheel diameter of the new locomotive meet these exacting conditions. For speed and economy in production, the general design has been based on a plate-framed Beyer-Garratt of which a number has been running for some years, but in detail the whole locomotive has been thoroughly modernised. Great care has been taken to include the latest experience in the design of detail of this type of engine to ensure efficient working with the least possible maintenance.

"Secret" Planning

It is obvious that war conditions necessitate a secrecy in making various kinds of arrangements, which would not be tolerated in a democracy in more normal times, but there is an increasingly widespread feeling in many quarters that advantage is being taken of these conditions to employ methods of secrecy quite unnecessarily, and to the detriment of the free discussion which many problems deserve and need. In particular is this the case with post-war planning. To a large extent such plans must be hypothetical, as no one can forecast what will be the condition of any country when hostilities cease, or what equipment will be left available to be handled by a plan. Where countries at present in enemy occupation are concerned, it would often be unwise to reveal publicly the extent of our knowledge regarding existing conditions, and perhaps to give a hint of our sources of information. On the other hand, a revelation of basic principle does not imperil security, and the main reason for concealing such proposals is usually the desire to spring a surprise on persons holding different political or economic views from those of the planners.

One of the considerations which induces us to make these remarks is the fact that various unofficial and semi-official bodies, institutes, and individually-interested persons are preparing schemes for post-war reorganisation, based upon particular political and economic theories, and are exercising a certain amount of influence by means of communications marked "Private & Confidential." One of the dangers of this course is that statements can be made, and are often accepted as facts, without the possibility of ventilation in Parliament or the press. Another danger is that such institutes, committees, and so forth, are apt to be accepted by many recipients of the communications at their own valuation, often based upon a high-sounding title, and opulent notepaper and brochures (which such organisations appear to be able to produce with far greater freedom than the Paper Control of the Ministry of Supply accords to ordinary publishers). So far as concerns the post-war planning of the European railway systems, the matter was discussed at some length in a leader in our issue of April 16 & 23 (page 399).

More Railway Criticism

WHEN Mr. W. Wakefield Adam, M.I.Mech.E., addressed a meeting of the Institute of Export on the subject of "A National Fuel, Power, and Transport Programme" on May 27, he made some very sweeping assertions about the British railways. He stated, for example, that in order to be able to carry out necessary improvements to bring British rail transport up-to-date, the four main-line companies should unite into one large Railway Transport Corporation, as unless this was done and proper services given to the country, nothing would prevent their being nationalised. Disregarding the obvious absence of any certainty that nationalisation and improved facilities are necessarily synonymous, he proceeded to make some sweeping criticisms as to such matters as the capabilities of railway directors, old and dirty carriages, and stations, etc. Finally he argued that if we could rectify the "enormous annual wastage of coal at present taking place on our railways, the savings effected would easily provide all the capital required to carry out the necessary improvements." His method for saving coal is the adoption of a very extensive system of main- and branch-line electrification on the lines of the report prepared by the Weir Committee for the Ministry of Transport in 1931.

Mr. Adam alleges it was stated in that report that the absolute net saving due to electrification, after allowing for all possible contingencies, was £17½ millions, representing a return of 6·7 per cent. on £261 millions, the capital cost of electrification. He completely overlooks the fact, however, that the £261 millions represented only the estimated *net* capital expenditure involved. Actually, the committee calculated that the conversion would cost £323 millions, and the provision of intensive suburban services would cost an additional £45 millions. Further, it also estimated that it would be necessary for the Central Electricity Board and other undertakings to expend about £80 millions on additional generating plant, transmission lines, substations, and so on, for the purpose of supplying sufficient electrical energy to the railways. The figure of £261 millions was arrived at by the proposed utilisation of steam locomotives renewal funds, the sale of part-worn locomotives, plant, machinery, and the like, as to which many points arise, while obviously such huge figures leave a substantial margin for error.

Moreover, Mr. Adam also failed to draw attention to the vital fact that the committee's estimates of receipts were based upon the 1929 traffics. From that date to the outbreak of war the railway companies experienced the full blast of unbalanced road competition, with the result that railway receipts in the years preceding 1938 were very substantially below the 1929 level.

Any future reconsideration of the electrification of main lines must, therefore, be preceded by the achievement of a fair basis of competition between road and rail. A further point is that damage by air raid to an electrical power station or substation may well have far more serious results than a similar attack upon a steam locomotive shed and this factor will have to be considered very carefully in connection with any large post-war electrification proposals. It may be news to Mr. Adam that the very large estimates quoted by the committee were based on figures which were worked out by consultant engineers for two sections of line only. They may not be typical of the country as a whole and, in fact, the same engineers prepared a scheme eight years later for the electrification of the Great Western Railway main line from Taunton to Penzance. In this case, mainly for geographical reasons, the return on the capital expenditure was estimated at 0.75 per cent., a sum quite insufficient to justify the company embarking on such a scheme. Should the Government decide for national reasons that the wholesale electrification of the railways is desirable, presumably it would undertake some financial responsibility in the matter. Further, the Weir Committee estimated that the change-over would take twenty years, during a considerable part of which time the railways would be involved in the expense of dual working by both steam and electric traction.

Finally, we may add that the British railways, under private ownership and managed by private enterprise, were able to place at the disposal of the Government on the outbreak of war an organisation which has enabled them successfully to meet every demand made on them by the fluctuating hazards of war and to maintain their services irrespective of damage caused by air raids. The British railways have proved beyond any doubt that they are of the utmost strategic importance to the national war effort, and there is no doubt that the restoration of peace will find them ready and adequately equipped to meet the new requirements of trade and industry.

C.P.R. Wartime Locomotive Performance

THE steadily increasing volume of wartime traffic handled by the Canadian Pacific Railway is such that traffic in 1942 was 49.8 per cent. greater than in 1939. To meet the need for increased locomotive power, the first step taken was to discontinue the withdrawal of engines which in normal circumstances would have been regarded as having reached the limit of their useful lives. Since 1939, such units have been repaired to form what is called second-line power. In addition, the company has already run 16,000,000 miles past normal overhaul limits in the 3½ years of war. Increased wagon loading has also been adopted extensively in order to make the most effective use of available locomotive power, but it is obvious that all these steps are expedients indicating the need for increasing the locomotive stock. Since the beginning of the war, and up to the end of March last, 64 new locomotives had been introduced into service by the C.P.R., of which 52 are of the 4-6-2 or Pacific type. These weigh 275 tons, with tenders, and will pull up to 4,600 tons, depending on the gradients. They were designed for fast freight work, but, due to the exigencies of war, it has been necessary for them to be used occasionally in passenger service. Of these Pacific-type locomotives, a dozen—numbered from 2366 to 2377 inclusive—were built in 1940, and all of them went to Western Lines for goods service on the Prairies. In the remaining 40 engines of this type the series number went past the 2300s to a new 2400 series number, from 2378 to 2417 inclusive. The last of this consignment was delivered in February of this year to make the distribution 13 for the Western Lines and 27 for the East. Special materials had to be used as substitutes. As an example, four-piece welded wrapper sheets of steel made in Canada were used on a few locomotives to avoid delay in delivery. Ordinarily, one large single wrapper sheet of steel obtained from the United States is used, which is preferable.

The balance of 64 is made up of 12 Mikado type locomotives, built in 1940, and numbered in the 5400 series. All went to the Algoma district in Northern Ontario. Last year, 20 additional Mikado (2-8-2) freight engines were ordered, and the first of these was delivered on April 1 last, as already recorded in our columns. The new 20 will be numbered from 5417 to 5436 inclusive. In their construction Canadian-made boiler shell plate has been used extensively, for the first time, so far as is known.

To expedite delivery, tender tank plate manufactured in Canada was also used in quantity for the first time. Before the war these materials were secured from the United States and from Great Britain. The new locomotives are being built by the Canadian Locomotive Company in Kingston, Ontario, to the specifications of Mr. H. B. Bowen, Chief of Motive Power & Rolling Stock for the C.P.R. All are expected to be in service by the end of this summer, and the intended distribution is to be 10 for each of the Eastern and Western Lines. The new 5400s weigh 280 tons, with tenders, and will haul up to 5,500 tons, or the equivalent of a 100-car train, depending on the gradients. They are so counterbalanced that they can be used for heavy passenger work when required, and can haul the long trains of sailors, soldiers, and airmen, which must go through on time. In design, the new locomotives are similar to the previous 12 Mikado type, built in 1940, with the exception that the steam dome has been omitted from the boiler on the engines now building. Completion of the order will thus bring to 84 the total of new locomotives added to the C.P.R. stock since the outbreak of war.

Rail-End Batter

THE problem of the battering of rail-ends is one which, in greater or lesser degree, faces every engineer responsible for the maintenance of railway track. It is least troublesome with the bullhead rail and the suspended joint, and the condition of rail-ends alone in this country is seldom sufficient to govern the time at which renewal becomes necessary. It is most serious, on the other hand, in countries where heavy flat-bottom rail sections and more rigidly supported joints are associated with high axle-loads and generally severe track wear; and it is significant that in the experimental lengths of flat-bottom track laid in recent years in Great Britain rail-end batter has soon begun to show itself in a more accentuated form than with previous bullhead rails in the same locations. L.M.S.R. engineers expected that there might be trouble with batter on their flat-bottom track and found it more serious on the 131-lb. than on the 110-lb., that is the stiffer rails. They flame-hardened the ends of the rails *in situ*, except in the case of the sorbitised rails which were not showing signs of batter. As its name suggests, battering is an acceleration, by the pounding action of the wheels, of the wear of the running surface of the rails in such a degree as eventually to form a "V"-shaped depression at each joint. It has been proved by experiment that packing up the track to a slightly higher level at the joint has little or no effect in reducing batter; nor has additional tightening of the fishbolts. In North America in the past it has been a regular practice to cut off the battered ends of rails that have been in service for some time, and to re-use them in shorter lengths. The more obvious remedy, if practicable, is to arrest the batter, and this is now being done on an extensive scale by various heat-treatment methods that apply a differential hardness to the portion of the rail-end which suffers by excessive wear in this way. In the eighth progress report of the American Joint Investigation of Fissures in Railroad Rails (an activity conducted by the Engineering Experiment Station of the University of Illinois in conjunction with the Association of American Railroads and the Rail Manufacturers' Technical Committee, and now covering a considerably wider rail field than the original terms of reference), an informative review is given of the effect on rail-end wear of a number of different end-hardening methods. Roughly 100 joints treated by each method were laid in the Chesapeake & Ohio Railroad at a site in Ohio, and these have been measured after the passage over them of 77,000,000 tons of traffic, covering a period of 22 months—an average of 3,500,000 tons a month—as a result of which all the joints showed a decided drop.

The most effective of the treatments appears to have been one carried out *in situ* by an automatic heating and quenching machine. The space between the rails was filled with a refractory cement, after which both rail-ends were heated in 2½ min. to 1,500° F. with a mechanically-oscillated oxy-acetylene burner with 11 flames. An automatic quench followed; 700 c.c. of water flowed on to the rail-head through 30 small holes in 13 sec. This treatment put the average Brinell hardness of the rail tread up from the normal 250 or so of an unhardened rail to 485, and after the 22 months of wear this further increased by work-hardening to the high figure of 520, with one extreme reading up to 564; as compared with a normal rail-end, batter was reduced by this means in the proportion of 12 to 4.55. Next in order of success was a treatment conducted at the rolling mill on rails that had already been Brunorized, or subjected to a normalising heat treatment, by being cooled in air to 1,000° F., and then reheated to 1,500° F.; after this the ends were quenched by an air-blast for 2½ min. Although the average Brinell hardness by this method went up only to 333, increased after

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22 months of work hardening to 374, such was the toughening effect that wear was reduced in the proportion of 12 to 5.3; and it is probable that the latter would be a considerably safer method, in guarding against embrittling and fissuring of the steel, than the former. A wear reduction in the proportion of 12 to 7.1 was achieved by an *in situ* flame-hardening process, in which six machine-held oxy-acetylene burners, three over each rail-end, heated the running surface to 1,550° F. in from 18 to 24 sec., and after this the steel was allowed to quench itself by conduction; an initial hardness of 315 was put up to 369 by wear, but the disadvantage of this method was a considerable difference between the relative average wear of the running-off and running-on ends at each joint.

A mill method that did well was the reheating of the rail-ends by producer gas, in a portable furnace with refractory lining, to 1,550° F., over a space of 3 min., after which quenching was carried out with a jet of compressed air for a similar period. This gave a Brinell hardness of 314, which work-hardened to 361, and reduced end wear in the proportion of 12 to 7.25. A simpler mill method was to utilise the rolling heat of the rails by allowing them to cool to 1,500° F. after leaving the hot saw, and to quench the ends with a water spray for 30 to 35 sec., finally cooling the ends out slowly under small portable covers; Brinell hardness figures in this case averaged 373 before and 384 after wear, and wear was reduced from 12 to 7.4 units. At another mill a more elaborate electric induction method was adopted for heating the rail-ends to 1,540° F., over a space of 80 sec., and quenching was carried out by an automatically-regulated flow of warm water for 30 sec.; this gave an initial Brinell hardness of 409, but there was no work-hardening effect, and the disadvantage of considerable differences between the wear of the running-on and running-off ends of the rails reappeared. There is little doubt that a mill method of hardening the rail-ends is preferable to one carried out *in situ*. The former can be conducted on the most systematic lines and under more accurate control; it requires less staff; no waiting for trains to pass or interference with traffic is involved; and if the heat in the rail after rolling be used as the basis of quenching, as in the last treatment but one that we have cited, mill treatment is bound to be considerably the cheaper of the two. The treatment just mentioned, with its use of the residual rail heat, water spray, and final retarded cooling, closely resembles the Sandberg sorbitic treatment. Should a demand for end-hardened rails arise in Great Britain, the simplest method of application, capable of very precise control, would be by the Sandberg process. An even better plan, however, at works equipped with Sandberg sorbitic plants, would be to sorbitise the whole rail, and by a suitable modification of the water pressures to harden the ends to a greater degree than the remainder. In this way the success achieved in the United States by end-hardening rails already Brunorized might well be repeated.

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The American Locomotive Whistle

PROBABLY there is no more distinctive feature of the steam locomotive in the public mind than its whistle. In pre-grouping days distinctive whistles characterised many of the British railway companies to a far greater extent than now obtains. On the other side of the Atlantic, with many railways still crossing highways on the level, and even in places traversing main streets, the locomotive whistle is used more extensively than in most countries. Recently, our American contemporary, the *Railroad Magazine*, published an article dealing with the origins and developments of the locomotive whistle. Many of its data concerning British practices were apparently obtained from the writings of the late Mr. Clement E. Stretton and perpetuated some of the inaccuracies and rather wild guesses which characterised a good deal of his work. So far as concerned the U.S.A., however, it seems that original research has contributed to bringing various interesting facts to light. According to the author, the first American locomotive to be equipped with a whistle was one built by Rogers, Ketchum & Grosvenor Foundries, of Paterson, New Jersey. This engine made its trial run on October 3, 1837, and this occasion is claimed as the first use of the locomotive whistle in the U.S.A. The story is told that Mr. J. H. James, President of the Mad River & Lake Erie Railroad of Sandusky, Ohio, was so fascinated that he insisted on buying the engine, although it had been constructed for another railway. It was dispatched to Sandusky (the name of which city was afterwards given to the engine) and arrived there on November 17.

Many stories are extant of the comforting sound of the locomotive whistle to western settlers, and its terrifying effect on Indians, but as steam pressures were increasing the whistles grew more harsh and shrill, and in the 70's and 80's the combination of small-size whistles and saturated steam produced a shriek about which many complaints were lodged. Indiana enacted in

1879 one of the first State laws placing penalties on locomotive drivers who failed to play the morse 7 (two long and two short blasts) at road crossings. The introduction of this law coincided with a particularly raucous period of locomotive whistle, and resulted in newspaper protests about the acute nuisance to residents near level crossings. The solution was found in the introduction in the early 80's of deeper tone whistles, often called "bull whistles." With a chamber of increased depth, they gave forth a heavier note. The New York & New England Railroad was equipped with such whistles about 1883. Coincidentally, chime whistles (such as had long been used for marine equipment) were adopted on the railway, and the first are believed to have been used by the Cincinnati, Hamilton & Dayton Railroad in 1883, and by the Chesapeake & Ohio Railroad in 1885. So drastic was the change that one newspaper suggested that the new whistles would prove sufficiently seductive to lure cattle on the track instead of frightening them away. An opponent of the change said that "dwellers along the line of the Chesapeake & Ohio are not ardent worshippers of Herr Wagner and therefore are not educated up to the harmony evoked by such whistles." Changes in whistle construction resulted from increasing steam pressures and the adoption of superheating about 1910. More recently, both railway officials and railway enthusiasts have given a considerable amount of attention to the positioning of the whistle on the locomotive, and in 1925 the head of the Department of Physics at Indiana University made investigations into the relation of position to carrying power. For use with petrol-electric, and subsequently diesel-electric, vehicles, air horns were developed about 1918, and today they vary from single-note instruments to those producing as many as five chiming pitches. Various combinations of long and short whistle blasts are used by U.S.A. locomotive drivers to expedite train operation, and there is a standard and quite extensive whistle code recognised throughout the U.S.A.

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Railways No Longer a Monopoly

SO far, the participation of the U.S.A. in the present world war has been markedly different from its period as a bel-ligerent in 1917 and 1918 in regard to its attitude towards the American railway systems. It may be recalled that in 1917 the Railroad War Board, consisting of a group of presidents of Class I railways, tried to pool the facilities and co-ordinate the operations of the railways in order to use railway equipment to its utmost efficiency in the wartime emergency. The Department of Justice did not feel that it had authority to waive the provisions of the Sherman Anti-Trust law in order to permit pooling of revenues and facilities, and difficulties therefore arose because the earnings of some railways would have been seriously affected through the necessity of routing traffic to provide the greatest efficiency for the railway transport machine as a whole. In addition, the various government departments issued priority orders indiscriminately to expedite the transport of materials, and under private operation the railways were not in a position to question the relative priority of these orders. Thus, through no fault of the railway administrations, but because a particularly acute situation arose through serious congestion on the railways and at the ports, the U.S.A. Government took the step of assuming control of the American railways towards the end of December, 1917. A Director-General, with equal rank of Cabinet officers, was appointed, in order to stop the indiscriminate issue of transport priority orders, and to give preference to essential war materials in the order of actual requirements.

In the present war it has not been found either necessary or desirable by the U.S.A. Government to take control of the railways in general, nor to interfere with their operations, excepting in minor cases. One important reason for the change in situation has been expressed recently by Mr. Joseph L. White* is the fact that the railways no longer enjoy a monopoly. In 1916 the inland domestic inter-city transport of the U.S.A. was practically all handled by the railways, and the only material exception was the large movement of traffic by vessels on the Great Lakes. Transport of crude oil by pipe line had been practised on a relatively small scale since 1879, but there were only 23,797 miles of interstate crude-oil trunk lines in 1919, compared with 53,641 in 1939, and moreover, there were no pipe lines for refined petroleum. The development of the great modern system of inland waterway transport on the Mississippi and Ohio Rivers and their tributaries was in its infancy, and the enlargement of the Erie Canal into the New York State Barge Canal was not completed until 1918. Intercity transport of passengers and goods by road was negligible, and by airway was nil.

* "Transportation and National Defense," by Joseph L. White, Philadelphia: The University of Pennsylvania Press, London: Oxford University Press, 84in. by 54in., 91 pages, plus 6 map plates, price 9s. 6d. net.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Higher Pay for Senior Railway Staff

June 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have noted for some weeks past the literary lamentations of the "over £500" salaried railway officers, appearing in your columns, and while appreciating the anomaly between the "just under," and the "just over," my tender feelings were not unduly lacerated as there does not appear to be any immediate danger of either group dying due to starvation. Viewed from the £300 mark a salary of £500, with, or without war bonus appears a pleasant, if remote, prospect.

The letter signed Aella in your issue of May 14 strikes a more responsive chord as it touches the scale of railway salaries generally. I think that many people will be surprised to learn that at one railway works which employs 4,500 workpeople all the executive officers and technical assistants, with the exception of two individuals, have salaries none of which exceeds £400 a year.

One is tempted to question the wisdom of the policy which permits such remuneration, as without doubt ultimately only second-rate engineers will accept low-grade pay, and those with initiative will use this desirable qualification to obtain appointment elsewhere.

What would industrial engineering executives think of £400 a year? In the same town a works about half the size of the railway works has six executives over £1,000 a year (excluding sales staff) and makes good profits. Along with many others, Ford has proved that good pay for the best brains pays.

Yours, etc.,
A.M.I.MECH.E.

Longest Regular S.R. Passenger Train

390, Wakefield Road,
Huddersfield. May 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the account on page 545 of *The Railway Gazette* of May 28, of operation of heavy trains on the Southern Railway, there is at least one point that is a matter for regret.

The departures from Salisbury and Sidmouth Junction on Run A suggest that starting before booked time is so freely accepted that the fact is made available to the press by the Southern Railway and published without comment. The operating staff's carefree indifference, as demonstrated by starting before publicly-booked time, is very common in the Huddersfield district and the fact that the same inexcusable fault occurs in other parts of the country is just another melancholy confirmation that a slap-dash "take it or leave it" attitude is now prevalent, despite the warmth of official praise for war-workers' efforts.

The fact that engines are changed at Salisbury seems to indicate that economy has not been pushed as far as it might. Surely there would be a distinct saving in using the same engine to work the train between Waterloo and Exeter, as has been done in the past. The distance of 171 miles would be very modest compared with what is done daily by the other three groups and as the up and down morning trains are in Salisbury at about the same time (12.27-12.30 and 12.33-12.38), a slight adjustment would permit an interchange of engine-men that would bring them back home in pleasingly quick time. Even the Exeter-Salisbury-Exeter "turn" (176 miles) would be no more fatiguing than some that are regularly undertaken by foot-plate crews on other British railways.

A continuous run of 88 miles is trivial for a modern main-line locomotive. On this basis the journey from London to Glasgow or Edinburgh would require five engines!

Yours faithfully,
W. A. TUPLIN

Mr. C. Grasmann, Public Relations Officer, Southern Railway, has provided the following reply to the above letter:—

General Manager's Office,
Waterloo Station, S.E.1. June 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In semi-technical papers such as *The Railway Gazette* it is usual for the Editor and his staff to assume that their readers will already possess certain knowledge of the subjects dealt with.

Mr. Tuplin's letter overlooks the basic principles of timetable work. Had he consulted the public timetable he would have seen that in the case of run "A" the train concerned left one

minute after the time shown to the public for Salisbury and two minutes in the case of Sidmouth Junction.

The suggestion that it is an axiom that the further an engine travels on a train the more economical it is, is also inaccurate, as the reverse is frequently the case because of many factors contributing to true economy.

As to comparisons with other railways, neither comparison nor boast has been made about this purely factual statement affecting the Southern Railway alone.

Yours faithfully,
C. GRASEMANN,
Public Relations Officer

Manganese Content of Rail Steel

41, Tothill Street,
London, S.W.1. June 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have just read Mr. Cecil J. Allen's most interesting paper on Steel Rails, in your issue of June 4. He refers, in it, to the valuable work done by the G.N.R., and continued by the L.N.E.R., on the question of manganese content, which resulted in the L.N.E.R., in 1930, breaking away from the British Standard rail steel composition in favour of medium manganese.

It might be of historical interest to students to know that the Egyptian State Railways (which, in general, follow British standards in railway work) had also given the matter of manganese content close study, which resulted in their taking the same important step a year earlier, in 1929.

The Railway Engineer of July, 1929, which devoted a complete article to the E.S.R.'s new specification, said:—

"It will be seen that these analyses correspond generally with the higher carbon analyses of the 1926 B.S.S. except for the significant fact that a minimum manganese content of 0.70 per cent. is laid down in every case, in addition to a maximum, and that the latter is raised, in the two open-hearth processes from 0.80 per cent. to 0.90 per cent."

Yours faithfully,
R. E. THOMAS,
Chief Inspecting Engineer,
Egyptian Government

Charles Dickens and Signal Lights

Northwood,
Middlesex. May 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the correspondence columns of *The Times* of June 7, 1935, a letter was published much on the lines of that in your issue of May 28. An ingenious explanation of Dickens' statement was given a few days later, to the effect that the green light turning to red was not a signal light but the lamp on the gate of the level crossing at the station. The level crossing light would change from green to red facing the highway as the gates were closed across it. Pedestrians coming down the road would see this and assume that the train was near and "run for it." But was it the practice to have a red or green lamp on the gate facing the highway?

The Curator of the Railway Museum wrote to the effect that a red light has been associated with danger ever since railway signals were generally adopted, but he gave a curious exception:—"The Brandling Junction Railway, opened in 1839, between Newcastle and Sunderland (Monkwearmouth), crossed the Stanhope & Tyne Railway. A white flag by day or a white light by night at this junction indicated that the road was clear for the Brandling line, a red flag or red light gave the proceed signal for the Stanhope line."

Yours faithfully,
REGINALD B. FELLOWS

A Spur near Oxford

Lillycombe,
Porlock. May 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—There are two possible answers to Mr. Kenneth Brown's inquiry in your May 14 issue. One is that there is a mistake in Airey's two maps, for there never was any such spur other than that to Oxford Old Station, much less one crossing the Thames.

On the other hand, he may be referring to the private siding from the south end of Oxford Goods Yard to the Gas Works, which does cross the River; but this is at least 1½ miles from Kennington Junction and has no connection therewith.

Yours faithfully,
E. T. MACDERMOT

The Scrap Heap

PHONETICALLY APT?

In the King's Birthday Honours List the honour of Knighthood has been bestowed on Mr. Harry Nell, who, appropriately enough, holds the position of Controller of Death Duties, Board of Inland Revenue.

Vegetables from the office garden of the London (East) Divisional Superintendent, Southern Railway, were included in a raffle organised recently by the Chief Clerk, and the proceeds (£27) were sent as a donation to the Merchant Navy Comforts Service.

British railway workers have contributed so far £203,011 to the Red Cross Penny-a-Week Fund. The totals raised by employees of the four main-line companies are as follow: L.M.S.R., £85,180; L.N.E.R., £68,961; G.W.R., £26,983; and Southern Railway, £21,887.

THE KING—No. 1 TRAVELLER

The King has seen more of Britain at war than anyone else. Since the war began he has made 252 railway journeys, covering 36,000 miles. He can attend to State affairs while on the royal train, which is used as headquarters on tours lasting several days and covering widely scattered places. Telephones on the train keep him in direct touch with London.—From the "Daily Express."

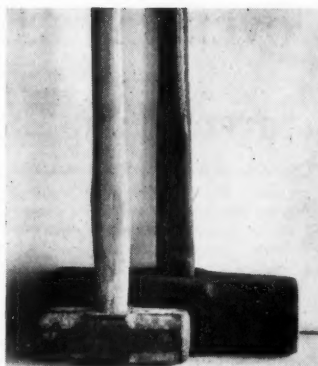
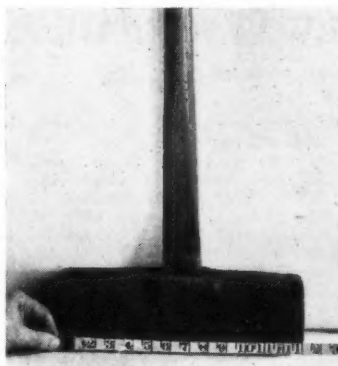
UNDER THE DEODAND

I suppose most of you have heard of deodand, that erstwhile principle of English law—in ancient times—that anything responsible for the death of a man could be confiscated, sold, and the funds used for some pious purpose, such as free drinks for the monks. I was surprised to learn that there was a case of deodand as late as 1840, when a locomotive boiler on offer to the Grand Junction Railway blew up without warning and scalded two men to death. In the report of the case I find that the verdict of the coroner's jury was: "We find that Thomas Scaife came to his death in consequence of the bursting of a boiler of a locomotive engine called (appropriately enough!) the "Surprise," the property of Samuel Aspinall Goddard, caused by

the boiler being constructed of iron plates which, in evidence, appear to have been of insufficient thickness, and we attach a deodand of £60 on the boiler." From which I gather that the gentleman could not have his boiler back until he had weighed out sixty sovereigns; but whether he paid up and took home his boiler complete with bust, or whether he let it go for scrap and kept the money, is not told—at least not to me, which is all that matters at the moment.—From "Mileator" in "The Morris Owner & Nuffield Mail."

Mr. J. L. Townshend, General Supervisor of Perishable Traffic, Canadian National Railways, states that a world's tonnage record for a refrigerator van was established recently when a shipment of frozen hog livers was moved over the system from Edmonton to a port in eastern Canada. The weight of the consignment was 92,400 lb., the heaviest to be transported in a single refrigerator van.

One of the fastest trains of its kind in the Dominion is No. 340 diesel electric of the Canadian Pacific Railway, which covers 41.64 miles between Regina and Moose Jaw, Saskatchewan, daily (except Sundays) in



There must have been some herculean gangers on the L.M.S.R. Tilbury Section in earlier days, for two 56-lb. hammers have been discovered in the Upminster Shops. It appears that they were used for bending rails, driving in piles, and making points and crossings. The usual weight of present-day similar hammers is 14 lb.

55 min. with four stops en route. It is known familiarly as the "Galloping Goose," and represents a combination of engine and baggage, express, mail, and passenger coach in one. Over the 10.3-mile stretch between Pasqua and Belle Plaine it maintains an average speed of 61.8 m.p.h. to cover the distance in an even 10 min. Trans-continental trains equal that time on the same stretch, but without slowing down for local stops.

VERDICT ON POINTS

The Ministry of War Transport, according to its Joint Parliamentary Secretary, is far advanced with its plans for beginning the work of providing the means for motor roads and the segregation of fast motor traffic. Just how far advanced this forward position is may baffle precise calculation. But we think it safe to assume that the Ministry has got its pencils sharpened.—From "The Glasgow Herald."

NO TIME TO BE FASTIDIOUS

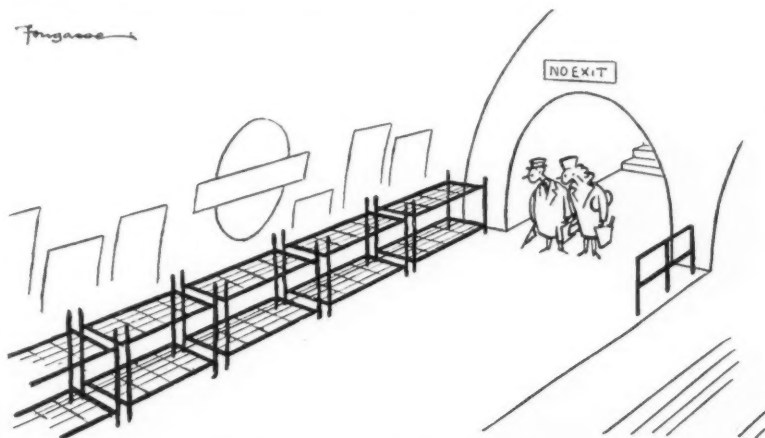
It happened at Blackpool. The train to Manchester was due to leave when two ladies made a last minute dash along the platform. The leader of the race wrenched open the door of a compartment, hesitated, and said over her shoulder to her companion: "It's a first." "Get in, get in!" cried the other urgently, giving her an admonitory push. "We shall have to put up with it!"—"Northern II" in "The Yorkshire Post."

TAILPIECE

(A curious reference to signal lights by Charles Dickens is referred to in our correspondence columns)

Dickens, you had, or so 'tis always said,
No rival in the gift of seeing red.
Wherever humbug ramped or wrong arose,
You'd up and blast it in immortal prose.
And can it be that nodding you had seen
By force of habit red when it was green?
The lights went red, the train began to draw
Noisily out? But was it red you saw?

E. C.



"Well, well—I'd no idea London was as crowded as that!"

[Reproduced by permission of the proprietors of "Punch"]

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

UNITED STATES

The Empire State Express

New methods of seat reservation, recently introduced on the Empire State Express of the New York Central System between New York, Buffalo, and Detroit, have been markedly successful. It will be remembered that towards the end of 1941 new streamlined trains were put on to this service; with the normal formation of the train, 622 seats, not including dining-car space, are available. All intermediate stops now are notified of the seating space available, so that the trains in each direction run filled. Records of 60 consecutive trips, which did not include any holiday periods, show that the Empire State Express carried a total of 60,882 passengers—34,078 westbound, and 26,804 eastbound—or an average of 1,015 passengers on each journey. This works out at 1·63 passengers a seat.

New Tracks in 1942

During 1942 the track laid down in connection with defence work of all kinds, including military, naval, and air force camps, training stations and depots, war-production plants, and so on, is estimated to have totalled rather over 8,000 miles. This is more than one hundred times the track laid down for purely railway purposes, which amounted to 74 miles only. The biggest individual railway project was the relocation of 30 miles of the Shasta main line of the Southern Pacific to carry it clear of the inundated country behind the new Shasta dam.

Steam Locomotive Programme, 1943

So far the War Production Board has approved the building in 1943 of 489 steam locomotives and all these are now on order with the locomotive building firms, or the shops of those companies which build their own engines. Of this total, 93 locomotives were ordered in 1942 but authority to build was withheld by the W.P.B. until January of this year. Practically all the orders are for engines of considerable power; 138 are to be articulated, and 351 non-articulated; 336 (80 of which will be articulated) are to have eight-coupled driving wheels, and 95, ten-coupled wheels; the remaining 58, all articulated, will have two groups of six-coupled wheels. Of individual wheel arrangements, the 4-8-4 is the most popular, and 129 of this type are on order, 30 of which are for the Atchison, Topeka & Santa Fe Railway System; next comes the 2-10-4, 95 in all, of which the Pennsylvania Railroad is building 85 in its Altoona shops; the 2-8-4 orders total 75, 40 of which are for the Chesapeake & Ohio Railway; and the 4-8-2 wheel arrangement is represented by 50, all of the New York Central System. There are also 50 articulated locomotives of the 4-8-8-2 type on order, all for the Southern Pacific, which is accumulating a large stock of these extremely powerful units; of 43 4-6-6-4 engines, the Union Pacific Railroad is taking 25. The list is completed by 15 2-6-6-4 locomotives for the Norfolk & Western Railway, to be built in that company's Roanoke shops, and two 0-8-0 shunters for the Bessemer & Lake Erie Railroad. Apart from these two shunters and 98 locomotives classified as passenger and freight (the Southern Pacific 4-8-8-2s, the 2-8-4s of the Chesapeake & Ohio Railway, and eight 4-8-4s for the Central of

Georgia Railway), all the locomotives are designed for freight service.

Of individual builders, the Baldwin Locomotive Works is responsible for 155 of the locomotives; the American Locomotive Company for 120; the Lima Locomotive Company for 109; and the railways themselves for 105 (Pennsylvania, 85; Norfolk & Western, 15; and Southern Pacific, 5). In addition to the foregoing, of course, all the builders have large orders on hand for the standard 2-8-2 and 2-8-0 types now being built for overseas war service. It may be added that the Office of Defense Transportation, which is dissatisfied with the locomotive-building allocations, threatens to introduce a system of rail freight priorities if the locomotive and wagon position is not eased, in order to safeguard the movement of essential freight.

A Timken Locomotive

On May 14, 1930, a 4-8-4 locomotive with 12-wheel tender, which had been built to the order of the Timken Roller Bearing Company, of Canton, Ohio, was put into service. The purpose of its construction was to demonstrate the advantages and economies made possible by the use of roller bearings for all axles, and for various motion parts. Carrying the number 1111, and the name "Timken" on the tender, this locomotive was loaned in succession to thirteen of the largest railways in the United States, including the New York Central; Pennsylvania; Missouri Pacific; Chicago, Burlington & Quincy; New York, New Haven & Hartford; Chesapeake & Ohio; Erie; and Northern Pacific; over whose lines it ran a total of 88,992 miles. It then was purchased by the Northern Pacific Railway, and became No. 2626 of that company's "A-1" class. On March 15, 1943, No. 2626 completed its first million miles of service, in 12 years, 10 months, which works out at a yearly average of 155,844 miles, or 12,987 miles monthly. There is little doubt that the behaviour of this locomotive in service has influenced considerably the widespread adoption of roller bearings in American steam locomotive practice.

ARGENTINA

Professional Meetings

At the annual general meeting of the River Plate Branch of the Institution of Locomotive Engineers, held in Buenos Aires on April 2, Mr. P. W. Dobson, Locomotive Superintendent, Buenos Ayres Midland Railway, was elected Chairman for the ensuing session, in place of Mr. J. Mailer, Chief Mechanical Engineer of the Buenos Ayres Great Southern Railway, and of the Buenos Ayres Western Railway, who has resigned. Due to war conditions, it was resolved unanimously that the present committee be re-elected for 1943.

The opening meeting of the sixteenth session of the Buenos Aires Association of Civil Engineers was held on April 16, when the Chairman, Mr. D. G. McCormack, Chief Engineer, Central Uruguay Railway, delivered the inaugural address, on "The Uruguayan Fuel Problem."

Road Construction

The Argentine National Roads Board has authorised the expenditure of 4,857,244 pesos on road construction and renewals. Of this sum, 984,774 pesos will be spent on

the releveling and resurfacing of 25 km. of highway between Benitz and Larrea in the Province of Buenos Aires; 1,470,485 pesos has been allocated for the construction of a road 44 km. long between Cebollar and Chumbicha, 36 km. of which will lie within the Province of La Rioja and 8 km. within the Province of Catamarca; and 913,347 pesos for the building of a road 34 km. long to connect Unanue and Cotita in the territory of La Pampa. It is proposed also to spend 1,082,991 pesos on a road 28 km. long, to connect Charbonier and Cruz del Eje in the Province of Córdoba; and 354,356 pesos on the construction of a mountain road 6 km. long in the Province of Salta, to connect Campo Quijano and Las Higuieritas, and terminating near the Chilean frontier; 51,291 pesos has been allocated for repairs to highways in the Province of Entre Rios.

SPAIN

National Railways Development

The Madrid daily *Ya* recently dealt at some length with the operation and development of the National Railway System (RENFE) in the year 1942. To the natural increase in traffic there was added the great volume of business resulting from the cessation of road transport by reason of fuel restrictions, but the railways succeeded in handling the whole without appreciable delay, thanks in part to the new system of priority and routing, and to the larger number of wagons, both repaired and new, placed in service. The locomotive position also was considerably improved, with the delivery of new engines constructed in the country, and the greater rapidity in the repair of old ones. Under the head of construction of new lines, it is recorded that the Santiago section of the Zamora-Corunna line is practically finished, and good progress is being made with the three viaducts on the Cuenca-Utiel link. Some of the narrow-gauge railways which had been closed have now been reopened to traffic. Such are the Carthagena-La Union, the Flaxa-Palamos, the Calahorra-Arnedillo, and Malaga-Torre Molinos. Good progress has been made with the electrification of the Madrid-Avila-Segovia section of the Northern line, now nearing completion. Work is proceeding on the elimination of 43 level crossings principally on the main trunk lines. Some idea of the development of the National railways is afforded by the fact that no less than 145 millions of pesetas were spent on new construction during the year, 95 millions on improvements of existing lines, and 100 millions on tractive power and rolling stock.

Supply of Sleepers

New regulations governing the supply of wooden sleepers to the Spanish National Railways came into force recently. These provide that state and privately-owned forests are to supply yearly a certain amount of wood suitable for sleepers, the amount to be fixed jointly by the Ministries of Public Works and of Agriculture. Pine is to represent 65 per cent.; oak, 30 per cent.; and beech, 5 per cent. A drastic provision is one entitling the Commission for Railway Equipment to seize wood suitable for sleepers stored with trading firms, to make up any quantities which forests may be unable to supply. The Decree fixes the price for broad-gauge 5 ft. 6 in. sleepers of pine at from 16 to 20 pesetas; beech, from 22·50 to 28 pesetas; and oak, from 20 to 32 pesetas, according to qualities.

British Railway Shareholdings in Road Transport

More than £20,000,000 of railway capital is invested in road transport, of which some £13,000,000 is represented by shareholdings in associated companies

PARTICULAR interest attaches at the present time to the earnings of the four main-line railway companies in road transport concerns, as these are excluded from the operations of the Railway Control Order. As has been our practice for some years past, we set out in the table below the railway shareholdings in the principal road passenger transport undertakings operating in the provinces, from which it will be seen that investments are profitable in securing a high return. The total sums invested in associated bus companies, as shown in the annual reports for the year ended December 31, 1942, are as follow:—

L.M.S.R.	...	£ 2,925,294
L.N.E.R.	...	2,315,792
G.W.R.	...	2,300,133
S.R.	...	2,105,675
Total	...	9,646,894

These amounts do not agree with the totals of holdings shown in the accompanying tables, as the former represent the cost of the investments, whereas the table shows the nominal holdings. As the Southern Railway Company's invest-

ments in passenger road transport undertakings are not charged to capital expenditure, the details are not given in the accounts, but once again we are enabled to include the figures by courtesy of Mr. R. G. Davidson, the Chief Accountant of the company. On page 580A we give a folding plate showing the organisation of the bus companies in the British Electric Traction Co. Ltd. and the Thomas Tilling Limited groups at January 1, 1943. This makes interesting comparison with the similar plate in our issue of April 17, 1942, inasmuch as the present one shows the current position after the segregation of joint assets held through Tilling & British Automobile Traction Limited, whereas the plate of a year ago represented the position before the reorganisation.

Goods transport by road is not susceptible of such easy definition, for the railways use many of their own parcels and goods motor vehicles (including mechanical horses), and also have large investments in some important firms of goods hauliers. The four main-line companies have invested (in equal shares of

£335,749 each) £1,342,996 in Carter, Paterson & Co. Ltd., and £1,840,568 in Hay's Wharf Cartage Co. Ltd. (of which Pickfords Limited is a subsidiary). The L.N.E.R. holds £84,808 in Currie & Co. (Newcastle) Ltd. and £17,000 in J. W. Petrie Limited; and the L.M.S.R. £142,939 in Wordie & Co. Ltd., and £135,049 in Joseph Nall & Co. Ltd. Some £4,689,069 is accounted for by railway-owned parcels and goods road vehicles, and £2,751,135 by garages and stables; these figures added to those of investments in goods hauliers, make a grand total of £11,003,564.

ANOTHER GERMAN RAILWAY NATIONALISATION.—Agreement has now been concluded between the Schipkau-Finsterwalder Eisenbahn and the Reichsbahn under which the latter is to absorb the undertaking of the company. Shares will be redeemed at 187½ per cent., and a dividend of 7½ per cent. is to be paid for 1943.

NEW DANUBE-TISSA CANAL.—The construction of a waterway connecting the Danube with the River Tissa was begun early in April. The terminal points will be at Soroksar, about 10 miles to the south of Budapest, and at Ujkécske, a port of call for steamers plying on the Tissa. Soroksar is on the Budapest-Belgrade railway. The canal is to be 66 miles long. Its construction is estimated to take some 8 or 10 years.

RAILWAY SHAREHOLDINGS IN PASSENGER ROAD TRANSPORT AT DECEMBER 31, 1942, SHOWING EARNINGS FOR THE PAST YEAR

Associated company	Issued share capital	L.N.E.R.		L.M.S.R.		G.W.R.		S.R.	
		Holding	Earnings	Holding	Earnings	Holding	Earnings	Holding	Earnings
Aldershot & District Traction Co. Ltd.	250,000 Ord. ...	£	£	£	£	£	£	£	£
W. Alexander & Sons Ltd.	825,000 Ord. ...	112,500	35,000	112,500	35,000	—	—	82,721	8,272
	250,000 6% Par. Pref. ...	125,000	—	125,000	—	—	—	—	—
Birmingham & Midland Motor Omnibus Co. Ltd.	1,440,000 Ord. ...	—	—	432,000	64,800	268,000	43,200	—	—
	100,000 8% Cum. Pref. ...	—	—	—	—	—	—	—	—
City of Oxford Motor Services Limited	226,000 Ord. ...	—	—	—	—	113,000	13,560	—	—
	74,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Crosville Motor Services Limited	1,100,000 Ord. ...	—	—	412,071	32,966	137,357	10,989	—	—
Cumberland Motor Services Limited	150,000 Ord. ...	—	—	49,999	9,000	—	—	—	—
Devon General Omnibus & Touring Co. Ltd.	200,000 Ord. ...	—	—	—	—	40,917	6,137	27,279	4,092
	150,000 7% Cum. Pref. ...	—	—	—	—	—	—	—	—
Eastern Counties Omnibus Co. Ltd.	756,000 Ord. ...	184,089	22,091	25,282	3,034	—	—	—	—
	200,000 5% Cum. Red. Pref. ...	—	—	—	—	—	—	—	—
Eastern National Omnibus Co. Ltd.	900,000 Ord. ...	225,000	24,750	225,000	24,750	—	—	—	—
East Kent Road Car Co. Ltd.	450,000 Ord. ...	—	—	—	—	—	—	151,355	14,108
	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
East Midland Motor Services Limited	250,000 Ord. ...	83,333	11,666	41,667	5,833	—	—	—	—
East Yorkshire Motor Services Limited	300,000 Ord. ...	149,362	22,404	—	—	—	—	—	—
Hants & Dorset Motor Services Limited	550,000 Ord. ...	—	—	—	—	—	—	213,556	38,440
	150,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Hebble Motor Services Limited	120,000 Ord. ...	15,000	2,250	45,000	6,750	—	—	—	—
Highland Transport Co. Ltd.*	35,000 Ord. ...	—	—	14,875	1,093	—	—	—	—
Lincolnshire Road Car Co. Ltd.	200,000 Ord. ...	63,929	6,393	15,985	1,599	—	—	—	—
Maldstone & District Motor Services Limited	750,000 Ord. ...	—	—	—	—	—	—	263,492	29,643
	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Northern General Transport Co. Ltd.	831,081 Ord. ...	365,767	36,577	—	—	—	—	—	—
	300,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
North Western Road Car Co. Ltd.	750,000 Ord. ...	124,444	22,400	248,888	44,800	—	—	—	—
Ribble Motor Services Limited	1,200,000 Ord. ...	—	—	530,445	53,044	—	—	—	—
	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Scottish Motor Traction Co. Ltd.	1,005,979 Ord Stock ...	251,495	67,065	251,494	73,984	—	—	—	—
	1,000,000 6½% Cum. Pref. ...	—	—	85,863	—	—	—	—	—
Southdown Motor Services Limited	750,000 Ord. ...	—	—	—	—	—	—	242,792	24,279
Southern National Omnibus Co. Ltd.	542,200 Ord. ...	—	—	—	—	—	—	271,100	18,977
Southern Vectis Omnibus Co. Ltd.	115,000 Ord. ...	—	—	—	—	—	—	57,500	9,200
	15,200 6% Cum. Pref. ...	—	—	—	—	—	—	15,000	900
Thames Valley Traction Co. Ltd.	250,000 Ord. ...	—	—	—	—	85,191	13,633	36,510	5,842
Trent Motor Traction Co. Ltd.	540,288 Ord. ...	75,147	7,515	150,293	15,029	—	—	—	—
United Automobile Service Limited	1,627,233 Ord. ...	798,412	146,488	—	—	—	—	—	—
	150,000 7% Cum. Pref. ...	39,622	—	—	—	—	—	—	—
Western National Omnibus Co. Ltd.	2,000,000 Ord. ...	—	—	—	—	1,000,000	114,000	—	—
	400,000 6% Cum. Pref. ...	—	—	—	—	400,000	—	—	—
Western Welsh Omnibus Co. Ltd.	507,500 Ord. ...	—	—	—	—	253,750	30,450	—	—
West Yorkshire Road Car Co. Ltd.	787,500 Ord. ...	195,843	39,169	195,843	39,169	—	—	—	—
	200,000 6½% Cum. Pref. ...	—	—	—	—	—	—	—	—
Wilts & Dorset Motor Services Limited	120,000 Ord. ...	—	—	—	—	—	—	30,724	6,145
Yorkshire Traction Co. Ltd.	437,500 Ord. ...	107,289	17,491	107,289	17,493	—	—	—	—
	24,350 7% Non Cum. Pref. ...	4,661	—	4,662	—	—	—	—	—
Yorkshire Woollen District Transport Co. Ltd.	528,000 Ord. ...	88,000	14,080	176,000	28,160	—	—	—	—
Totals	...	3,008,893	475,339	3,250,156	456,504	2,318,215	231,966	1,392,029	157,898

* Highland Transport Co. Ltd. shares are 17s. The L.M.S.R. holds 17,500 ordinary shares

The Railways of Peru

Disconnected systems, leading from the coast towards the mountains, comprise a total mileage of 1,947

PERU has an area of 482,275 sq. miles, with a coast line of 1,400 miles, and the population at the 1940 census was 7,023,111. It is bounded on the south by Chile and Bolivia, on the east by Brazil, and on the north by Colombia and Ecuador. The great chain of the Andes divides the country into three clearly defined zones, the coastal, the Andean, and the forest region lying within the basin of the Amazon. The coastal region is rainless, and much of the great plateau of the Andes, lying from 10,000 to 16,000 ft. above sea level, is also arid,

but throughout these rainless zones a system of artificial irrigation, carried along countless terraces on the hillsides, provides the agricultural produce that constitutes the chief source of wealth. Petroleum and minerals constitute the other principal resources of the country. These national features have perforce shaped the evolution of the railway system of the country, which has developed in the form of a number of separate lines leading from the coast inland towards the mountains. Private enterprise seems to have played but a small part in the growth of rail communications, and most of the earlier lines were due to the initiative of the Government. Henry Meiggs, the American engineer, was actively engaged in the construction of many of them, but lack of revenue seems to have hindered any organised development. The Peruvian Corporation Limited, a British company, owns and operates more than half the total mileage, having received the lines through the settlement of the foreign debt in 1890. The principal railways of the Corporation, which are also the most important of the Peruvian railways, are the Southern and the Central. The Southern is the longest, with a route-mileage of 535. The Central comes next, with 259 route-miles. Both these, and indeed, all the more important railways, are on the standard 4 ft. 8½ in. gauge.

Subjoined is a list of the Peruvian railways, according to the latest information available:—

	Gauge	Mileage
Peruvian Corporation Railways:		
Southern ...	4 ft. 8½ in.	535
Central ...	"	259
Pacasmayo-Guadalupe ...	"	28
Paíta-Piura ...	"	60
Pisco-Ica ...	"	50
Trujillo ...	3 ft.	60
Chimbote ...	"	35
		1,081
Other privately-owned railways:		
Cerro de Pasco ...	4 ft. 8½ in.	118
Arica & Tacna ...	"	40
Eten-Ferrenafe-Patapo ...	"	50
Lima Tramways ...	"	56
Cayalti-Eten ...	2 ft.	54
Supé-Barranca-Alpas ...	"	34
Pimentel ...	3 ft.	34
San Nicolás (private and goods traffic) ...	3 ft. 6 in.	19
		405
State Railways:		
North Western of Peru ...	3 ft.	62
Huancayo-Huancavelica ...	"	81
Cuzco-Santa Ana ...	"	68
Ilo-Moquegua ...	4 ft. 8½ in.	63
Lima-Lurin (leased) ...	"	29
Tabloncillo-Huallanca ...	"	51
Tumbes-Puerto Pizarro ...	2 ft. 6 in.	7
		461

Total, all railways ... 1,947

Note.—This list does not include certain mining lines nor the plantation railways on sugar estates

The Southern Railway, running from the port of Mollendo on the Pacific coast, through Arequipa to Puno and Cuzco, affords communication—by the steamers worked by the Corporation on Lake Titicaca between Puno and Guaqui, and by the railway from the latter point to La Paz—with the neighbouring republic of Bolivia. The Guaqui—La Paz line, although in Bolivian territory, is owned by the Corporation and worked by the

(Continued on page 584)



Sketch map of the coastal areas of Peru showing the principal railways; the position of Peru on the South American continent is indicated on the insert

Reducing Derailment Hazards

A derailment safety-guide, now applied by the Southern Pacific Railroad to the bogies of passenger coaches, keeps the vehicles in line in the event of derailment

EXPERIENCE gained by American railways in recent derailments has suggested various methods now in course of application to new and existing rolling stock, whereby hazards of this description can be greatly reduced. In later derailments the efficacy of one of the new devices, known as a safety guide, has been proved. It was in the wreck of the streamliner City of San Francisco near Harney, Nevada, in the summer of 1939, that some valuable lessons were learned. The wreck was due to the action of saboteurs, who unfastened a rail, moved

it several inches inward, and respiked it in such a way that it would act as a single-tongue trap, facing in the direction in which the streamliner was running at about 60 m.p.h. The train at this point was on a curve approaching a bridge over the Humboldt river. The three heavy cars housing the diesel-electric power units kept on over the bridge, and the first of them, when it came to rest, though derailed, was still in line with the track, and the first five vehicles remained coupled. The trailing cars gradually swung out of line until they tore down

the superstructure of the bridge, and it was in this section of the train that the serious destruction of equipment and loss of life occurred. The fact that the diesel-electric power cars had held to the track even after derailment resulted in a close examination being made of the reasons for this action. These units carry large traction motors on the axles, and it was found that when the leading traction bogie dropped off the rail, the rail-head engaged in a small space between the motor-frame and the gear-case, and in this way the bogie, assisted by the bolts and nuts securing the binder bars to the bottom of the bogie pedestals, held the track. Marks of abrasion and burning on these bolts and nuts showed the severe treatment that they had sustained by this skidding action. The trailing cars, having no motor gear, were not so fortunate, and the binder bolts alone were not sufficient to take their weight and to hold them to the track.

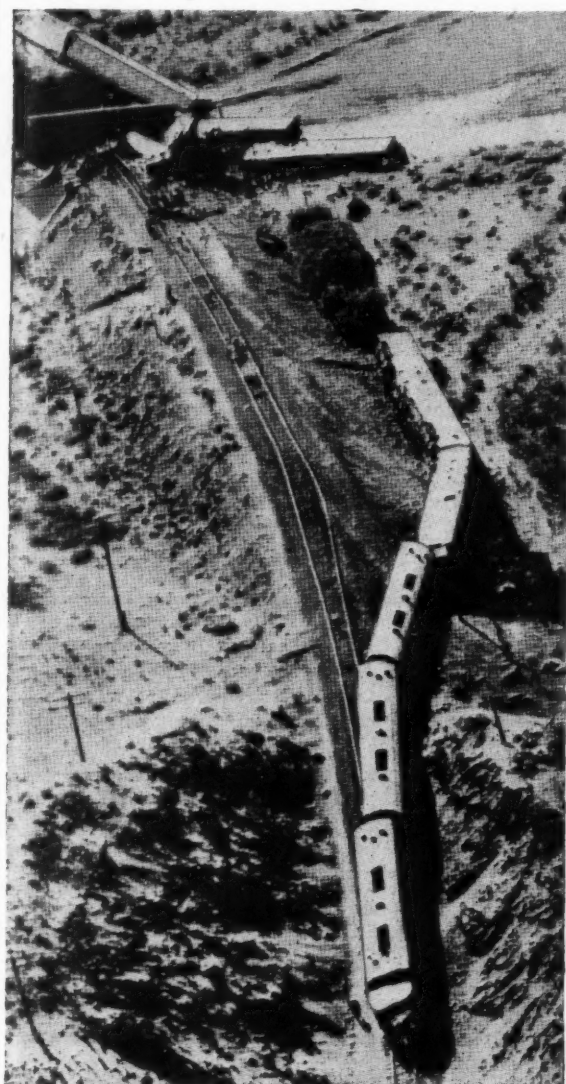
The behaviour of the head-end cars of the City of San Francisco in this derailment suggested the addition of a simple safety device which in addition to others that proved equally valuable in the accident—in particular

the tight-lock coupler that held the five leading cars in line, so preventing telescoping, and the bolster locking centre-pin, which kept the bogies firmly attached to the underframes of several of the cars that suffered the worst punishment—would keep the car bogies from swinging into a diagonal or right-angled position in the event of derailing, and so minimise one of the principal hazards of such accidents. The device so perfected is known as a "derailment safety-guide," and is the joint patent of Mr. George McCormick and Mr. B. M. Brown, respectively the former and present General Superintendents of Motive Power to the Southern Pacific Railroad, on the tracks of which the accident took place (the City of San Francisco is the joint property of this company and the Union Pacific and Chicago & North Western Railways). The safety-guide has been applied to a large number of cars throughout the United States, and already has had several opportunities of proving its value. It is simple in design, adds very little weight, and in some types of passenger car bogie takes the place of the usual pedestal tie-bar or binder.

At the outside edge, when the safety-guide is applied to the pedestals of outside journal boxes, there is a vertical flange which extends downwards to a minimum distance of 4½ in. above the running surface of the rail when the tyres of the bogie wheels are new. If the wheels drop from the rails on to the sleepers, this flange engages the head of the rail, preventing further lateral movement of the bogie; the underside of the guide then skids along the rail-head, carrying the weight of the car until it is brought to rest.

In a series of tests conducted to observe the behaviour of the safety-guide in the conditions for which it was designed, a series of deliberate derailments was staged at speeds of 10, 20, and 30 m.p.h. These were brought about by pulling or pushing the test car over a standard portable derailer, or by moving one of the rails to the derailing position, as was done by the saboteurs before the Harney accident. The final test was to derail the test car at 30 m.p.h. by using a portable derailer on a curve of 7½ ch. radius. After the derailment this car travelled 75 ft.; the front bogie, equipped with the derailment safety-guide, held the track, but the rear bogie, not so equipped, moved laterally until its near-side wheels were against the off-side rail. Moreover, the rear wheels of the front bogie, although they passed over the derailer, rerailed themselves by the action of the safety-guide in holding the front pair of wheels in line. Marks both on the rails and on the guides, after these test derailments, showed the severe forces that had come into play, and indicated the adequate strength and successful design of the guides in resisting all tendencies to slue the test car bogies out of line. A bogie wagon was used for the tests, fitted with bogies of the type used on the streamline trains, and fully loaded to represent the weight of a standard streamline coach.

The second test was unpremeditated, but no less successful. In September the Lark express of the Southern Pacific Railroad, an all-Pullman train of the latest streamline stock making the night journey between Los Angeles and San Francisco, was held up by adverse signals at Wellsonia, California, when it was run into from the rear by a fast freight train travelling at 22 m.p.h. All the cars of the Lark were fitted with derailment

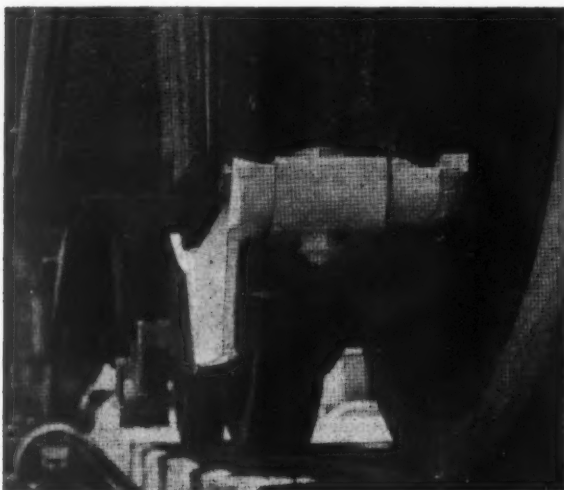


Derailment of City of San Francisco at Harney, Nevada, in 1939. The leading diesel-electric power car held to the track; the cars did not

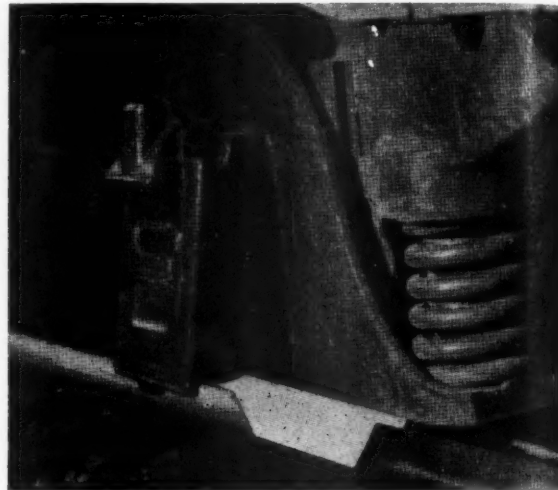
safety-guides. At the moment of impact, the engine of the freight train practically destroyed the rear car of the Lark and pushed it to one side, then hitting the next car in front. From this point forward a number of the passenger cars were derailed, and there was a strong inducement to the cars to "jack-knife," or assume positions angular to one another.

delay has been prevented by the safety guides. A locomotive on the main coast route ran over an obstruction at a crossing which caused the bogie to derail, but the guides kept the bogie in line, and enabled the train to be pulled up safely in 900 ft.; it is the turning crosswise of bogies in such conditions that has frequently caused locomotives to overturn

on a worn switch, but although the thrust of the safety-guides was again sufficient to overturn the rails, the guides came through with only minor abrasions, and kept these heavy power units in line, as well as protecting them from damage, with the result that rerailling was a comparatively simple matter. In all, the Southern Pacific Railroad has applied this



Application of a safety-guide to the pedestal of a conventional six-wheel equaliser type passenger truck



Bogie of derailed car in the Wellsonia derailment; the rail has overturned, but the bogie has kept in line with the track

However, the safety-guides lapped over the rails as the bogies derailed, and though they exerted so strong a lateral force as to overturn several of the rails, the cars were all held in line. It was evident from subsequent examination that some of the guides had skidded for a considerable distance along the rails.

There have been other Southern Pacific casualties in which serious trouble or

in the past, and has resulted in serious wrecks. A locomotive was being backed on to a turntable at El Paso when the leading wheels of the tender derailed through the turntable being out of line, but the safety-guides prevented any other wheels from leaving the track. At Oakland the power unit cars of the City of San Francisco were being moved through the yard when they derailed at 10 m.p.h.

simple and effective device to 860 units of rolling stock to date. The foregoing details formed part of a paper read on September 10 last by Mr. L. R. Schuster, Engineer of Car Construction, Southern Pacific Railroad, to the Pacific Railway Club, and reported in our American contemporary the *Railway Age*, to which we are indebted for the use of the illustrations reproduced.

THE RAILWAYS OF PERU

(Concluded from page 582)

Southern Railway administration. The service Mollendo—La Paz, in conjunction with the all-rail route La Paz—Buenos Aires, provides a transcontinental route which is becoming increasingly popular. The Southern Railway between Mollendo and Arequipa was constructed for the Government by Henry Meiggs, and was opened in 1870. The Central Railway, running from the port of Callao, through the capital city of Lima, to Huancayo, although not the longest, is the most important railway in the country. The construction was also entrusted by the Government to Meiggs, and was begun in 1870. It was intended to give an outlet to the coast for the mineral wealth of the interior. Meiggs died in 1877 and the construction was continued by a company until 1890, when the line was handed over to foreign bondholders. It was completed to Oroya, 138 miles, in 1893, but the extension of 77 miles to Huancayo was not opened until 1938. The Central Railway is in many ways a very remarkable line. It is the highest standard-gauge railway in the world, climbing from the coast to Ticlio station, on the main

line, 15,610 ft. above sea level, and the Galera tunnel, just beyond, 107 miles from Callao, at 15,694 ft., while La Cima, on the Morococha branch, is even higher, at 15,806 ft. To gain these heights, at a relatively short distance from sea level, a series of zigzags carries the line up the precipitous mountain slopes. Fifteen of these zigzags are used, with a corresponding number of reversals of direction. No rack rails, cables, or spiral tunnels are used on this remarkable ascent.

In addition to the Southern and Central Railways, the Peruvian Corporation owns five smaller lines, as well as owning and working the Guaqui—La Paz railway in Bolivian territory. These smaller lines in every case are isolated railways running inland from the coast, each with its own local administration. The Corporation has adopted a progressive policy, and, among other modern improvements, Garratt articulated locomotives are now used on the steeper grades, and of recent years numbers of diesel railcars have been placed in service, to meet intensive road competition.

Other privately-owned railways in Peru are in most cases unconnected and based on coastal ports, serving points in the

interior. The State owns and operates a small number of relatively short lines, of which the most important is the North Western, 162 miles of 3-ft. gauge. A project for the extension of the Huancayo—Ayacucho—Huancavelica Railway, to connect the Central and Southern railways, dates back to 1904, but little progress has been made with the scheme. There is, however, under construction the Pachitea (or Ucayali) Railway, intended to connect the mountain region with the eastern river zone, and some 70 km. have been completed from Tambo del Sol on the Cerro del Pasco Railway. The northern terminus is to be Pucallpa (480 km.), on the Ucayali River. Construction is also proceeding on a line from Ascope to the head of the Chicama River; and on one from Huacho to Supe and Barranca.

ARGENTINE WHEAT STOCKS.—The Argentine Minister of Agriculture announced recently that he calculates that wheat stocks in the country in December, 1943, will amount to 5,000,000 tons. A recently-issued decree prohibits the export of peanuts, cottonseed, and rapeseed, and their respective oils.

All-Wood Construction for Girder Work

The necessity for economy in the use of steel has led to wood being used in Germany for bridges and travelling cranes

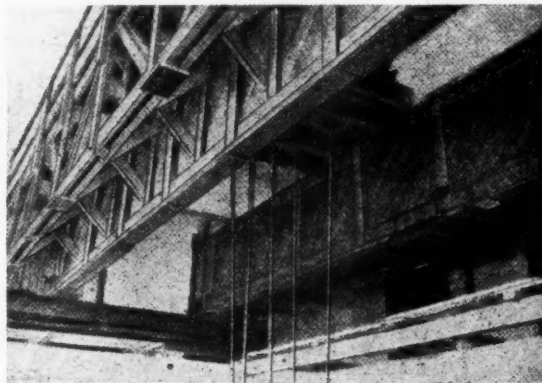
WITH a view to economising in the use of steel, public authorities in Germany have developed a system of constructing bridges and other structural works out of plain wooden planking, merely sawn off to length, cut to shape at the ends and nailed in position, so dispensing with any highly skilled labour.

Every other cross member projects far enough to support the footway. The compression members are formed of two sets of planks, spaced apart so that the tension members can pass between them. The central portion of the bridge has crosswind bracing, both top and bottom, and special attention has been given to secur-

travelling crane, itself installed in the Karlsruhe testing station, the main cross girders of which, of 12 m. (39 ft. 4½ in.) span, have been constructed on the plank-and-nail method. They are placed 2.85 m. (9 ft. 4½ in.) apart, to suit a 25-tonne crane mechanism that was available. The two girders on which the rails for the crane movement run, are formed with solid walls of double diagonal planking strengthened by longitudinals and verticals, all nailed together; the whole is 1.57 m. (5 ft. 1½ in.) high; the top and bottom flats are formed of double plank-



Bridge over river built on the Gaber system of "plank-and-nail" construction



Travelling crane girders constructed on the "plank-and-nail" system

This form of construction, called the "plank-and-nail system," has already been extensively used, it would seem, and several references to it have appeared in the German press. We reproduce therefrom two illustrations, one of a cross-river bridge, described as a "first class" road bridge, the other of a travelling crane; both are interesting examples of this class of work.

The bridge, the locality of which is not disclosed, is 320 m. (350 yd.) long and was built in 2½ months. It rests on pile piers of round wood, suitably braced with cross members, as usual in temporary bridge work, and has a 50 m. (163 ft.) opening for vessels to pass. This opening is spanned by a double set of box girders, exclusively formed of nailed planking, which provide two pathways for vehicles, each 3.7 m. (12 ft. 2 in.) wide; the footways, 1.6 m. (5 ft. 3 in.) wide, are led round each side of the girder work. The plank roadway is itself carried on I girders formed from planks; the webs are composed of a double row, arranged diagonally in opposite directions. There are four longitudinal girders under each single-width roadway and two under each footway; the latter rest on the cross members and the former are let into them.

ing proper resistance to buckling. Tests were made on full-sized pieces of girder to ensure that proper strength was obtained. The ordinary roadway, on each side of the main portion, is 7 m. (23 ft.) wide and there are 13 spans of 20 m. (65 ft. 7 in.) each, carrying it. The girder work is 1.84 m. (6 ft.) deep and there are 7 girders in all, suitably cross connected and braced.

The planking is used directly from the saw mills and is treated with preservative compound before being erected. All nails are coated with a rust preservative. The various girders are put together out of carefully cut lengths of wood arranged in frames to ensure absolute uniformity in the completed portion. No drilling is necessary and, in fact, is considered inadvisable. The general design of this form of construction is due to Professor Gaber, of Karlsruhe, who had arranged for special apparatus to be installed at the Technical High School for the express purpose of testing it. The results are said to have fully justified the step. The Germans are no doubt finding it necessary to replace many bridges destroyed in the territories they have over-run and the growing shortage of steel is making itself felt.

In our second illustration is seen a

ing. This form of construction was used in the bridge referred to above. The two outer girders are formed on the open lattice principle and braced to the main solid girders by cross bracing at the top. This is secured by steel gusset plates and coach screws to the latter girders but to the lattice girders by nails only. There are nine double diagonal bracings between the two girders but no direct cross bracing at the bottom chord. Tests on the completed structure with crane mechanism in position and a 33-tonne load—1½ times the normal—gave 16 mm. deflection (⅝ in.). As a greater deflection than would be usual with steel has to be reckoned with in normal working, an elastic coupling was introduced between the motor and the main crane shaft.

Experience with bridges shows that cranes up to 30 m. (98 ft.) span could be safely built on this system, and up to double that if the heavy lattice form of girder were to be used throughout. With careful consideration to stress and strain action the amount of wood needed can be kept to a minimum and a very little experience enables workmen to become skilled at building structures by the use of this method in a remarkably short time.

G.W.R. RATING ASSESSMENT.—A circular has been issued by the Railway Assessment Authority dealing with the draft of the third railway valuation roll so far as it relates to the Great Western Railway. The average net receipts of the undertaking for the five accounting years 1935-39, as entered in the draft roll, are £6,075,335. The cumulo is entered at £1,631,068, and compares with the cumulo of £1,400,000 in the second roll, an increase of approximately 16½ per cent. Of the new cumulo of £1,631,068, there has been allocated to the principal undertaking £1,519,343, to the

docks £110,760, to the canals £885, and to certain subsidiary undertakings £80. Of the sum of £1,519,343 there has been allocated to Class A as a whole £1,276,248 and to Class B as a whole £243,095.

RECEIPT FORMS FOR SALVAGE.—Old receipts form a large part of the paper accumulations of private individuals and business concerns. In most cases these receipts could be disposed of safely, but people are loth to part with them unless they are convinced that they are not storing up future trouble for themselves. The

Waste Paper Recovery Association suggests that, when issuing receipts for payments in full settlement of accounts, if the words "arrears nil" or "account paid in full" are written on the current receipts, or, better still, if a note to the effect that it is unnecessary to retain past receipts is added, then the customer will feel that he safely can send his previous receipts for salvage. The adoption of this simple procedure, by large business concerns and public-utility companies in particular, would release a large tonnage of paper for munitions of war.

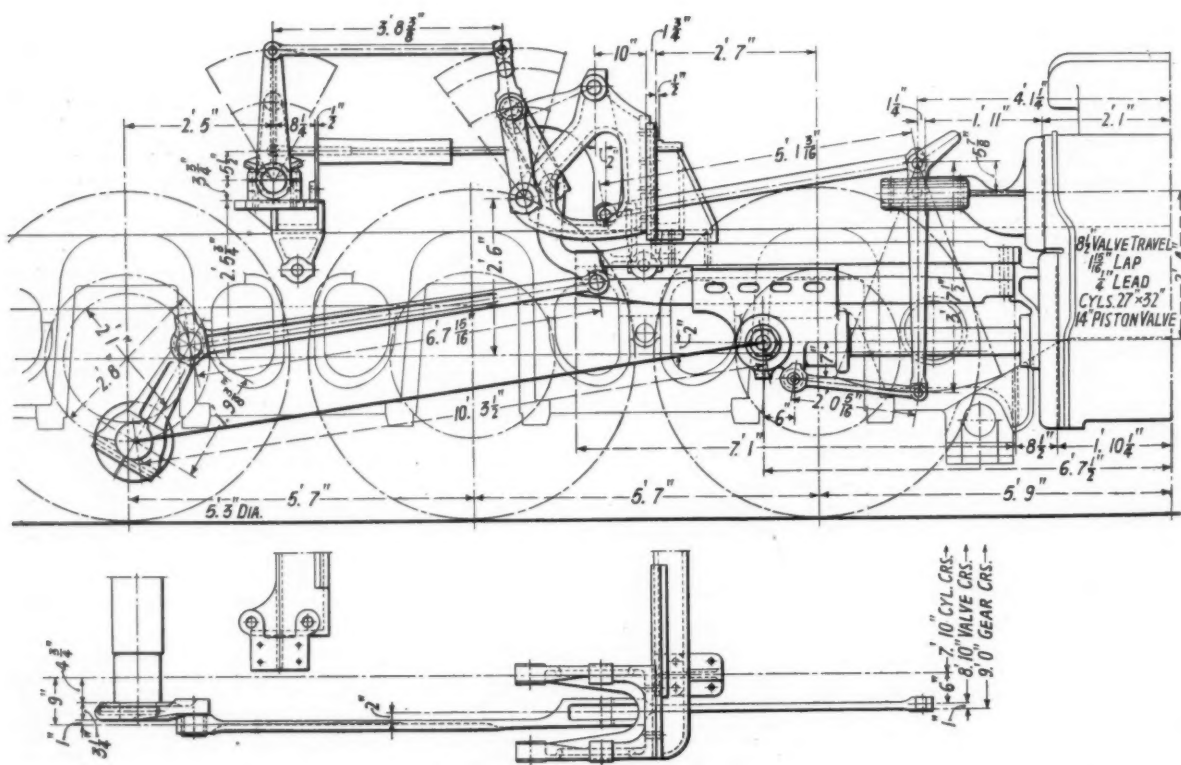
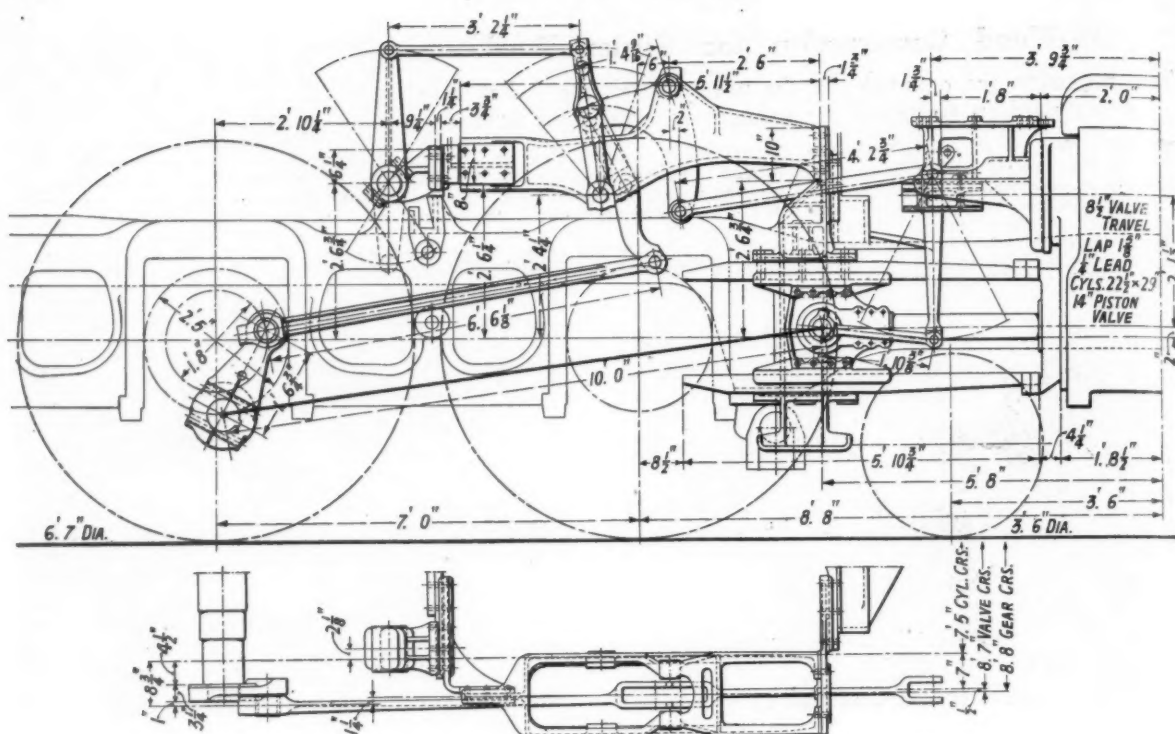


Fig. 2—Baker valve gear with triangular gear frame

THE BAKER VALVE GEAR (See article opposite)

The Baker Valve Gear

A gear of American origin, similar in principle to the Walschaerts, is fitted to 15,000 locomotives in the U.S.A.

(See also drawings on opposite page)

MOST widely used valve gear of all in modern locomotives is that due to Walschaerts which lends itself very readily to the outside arrangement of cylinders and dispenses with eccentrics. However, in the United States, there appears to be a growing tendency to employ the Baker type of valve gear. It was recently reported in the American technical press that 15,000 locomotives in the United States are now fitted with the Baker gear and that this gear is being adopted as standard by a continually increasing number of American railways.

"J-3a" locomotive—an application by the Pilliod Company, of Swanton, Ohio, which manufactures valve gears suitable for fitment to a wide variety of locomotives. The gear shown in Fig. 1 has what is termed the long gear frame. In other applications a triangular gear frame is used as shown in Fig. 2.

Fig. 3 shows the bare essentials of a gear of the long frame type and gives the descriptive names applied to its working parts in the country of its origin.

The Baker gear combines the motions of

the reverse yoke) and the length bf on the gear connecting rod. Due to this difference the valve rod will have a slight to-and-fro motion even in mid-gear.

The rise and fall of pivot f due to the rocking action of the bellcrank will be transmitted to the lower end d of the gear connecting rod so that the eccentric rod will have a decided rocking motion about its return crank centre, and this will appreciably affect the timing of valve events.

It is claimed for the Baker gear that in comparison with Walschaerts, it enables a longer valve travel to be employed. For this and other reasons, probably connected with the supplementary motions mentioned above, the events of release and compression are delayed to occur at more suitable points in the piston stroke.

Furthermore, the opening and closing

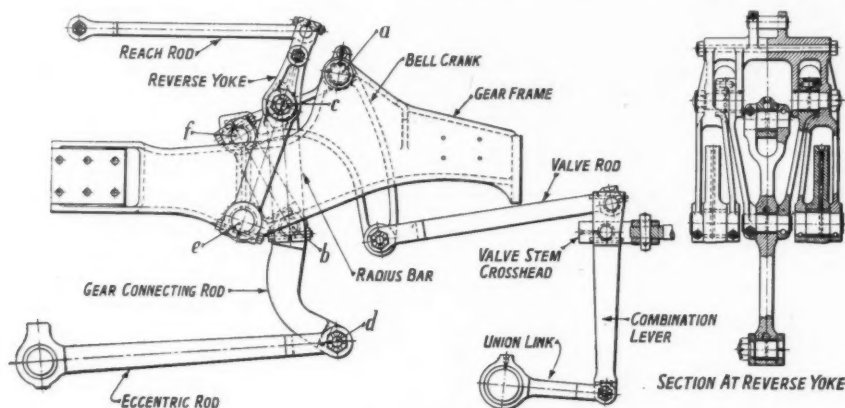


Fig. 3—Baker valve gear assembly for American locomotive, showing the names of the component parts. All diagrams show gear arranged for inside admission

Locomotives recently constructed with the Baker gear include some 4-8-4 type engines built by the Lima Locomotive Works Incorporated for the Chesapeake & Ohio Railroad. These have 27½ in. by 30 in. cylinders, 72 in. driving wheels, and boosters. The boiler pressure is 255 lb. per sq. in.; the tractive effort is given as 68,300 lb. or, with the booster in use, 82,700 lb. A further recent application is to the Hudson 4-6-4 type locomotives built for high-speed service on the New York Central System. One of these was illustrated on p. 94 of our issue for January 22. Light 4-8-2 locomotives with Baker valve gear were built for the New Zealand Government Railways by the North British Locomotive Co. Ltd. A description of these was given in the March 22, 1940, issue of *The Railway Gazette*.

General Description of Gear

The Baker gear is far from new; the first American patent on it was granted in 1908 in which year also it was first tried experimentally on a locomotive. At first the inventors, Mr. Abner D. Baker, of Swanton, Ohio, and Mr. Charles J. Pilliod, of Angola, Indiana, intended the gear to be used in traction engines. After undergoing a period of development covering about two years the gear was considerably modified, and in 1910 it became very much as it is to-day. For a description of the original gear we refer our readers to *The Railway Engineer* for June, 1909, and for a description of the improved gear reference should be made to the same journal for March, 1911.

The diagrams accompanying the present article show modern applications of the Baker gear. Fig. 1 shows its application to the New York Central 4-6-4 type Class

what is virtually a variable throw eccentric, set at right angles to the main crank, with what is virtually a fixed throw eccentric, set opposite to the main crank, thus giving an equivalent eccentric of variable throw and with an angular advance varying up to 90° for both forward and reverse directions of rotation. The fixed component is derived, as is usual, from the crosshead, and the variable component is derived from a return crank which operates through a stroke-varying mechanism under the control of the driver. The two components are summated by a combination lever. The description given here tallies exactly with that for the Walschaerts gear and, in fact, the only difference between the two gears lies in the stroke-varying mechanism used to control the amplitude of the return-crank component of the valve motion.

This mechanism for the Baker gear is clearly shown in Fig. 3. The valve rod is actuated by the eccentric rod via the gear connecting rod and the bellcrank. The bellcrank is permanently pivoted to the gear frame at a but the gear connecting rod is suspended at an intermediate point b from a movable pivot c by the radius bar. Pivot c , which is fixed for any particular gear setting, can be repositioned at any point desired, and it is the function of the reverse yoke to hold it at the appropriate setting.

Those who are interested in the finer points of the valve gear design will note that the pivot axis d between the eccentric rod and the gear connecting rod, is set back like the link foot in the Walschaerts gear. A further point worthy of remark is the inequality between length bc of the radius bar (which is equal to length ec on

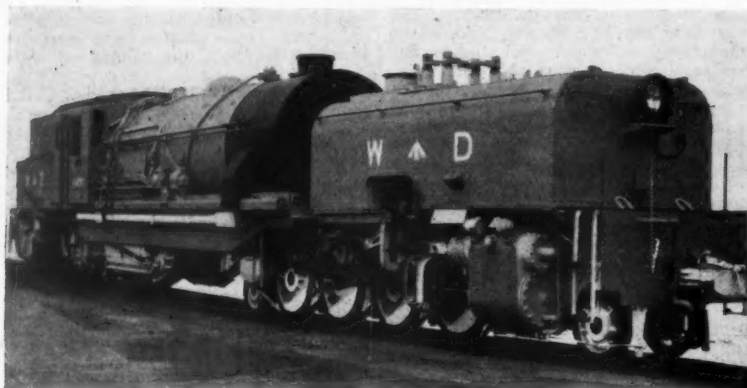
of ports is more rapid. For these two reasons an engine with the Baker gear gives a fuller indicator diagram, more particularly at high speed.

The additional claim is made that notwithstanding the multiplicity of joints, the gear suffers less from lost motion, particularly after long usage, than rival forms of gear. To the advantage offered by the Walschaerts gear of freedom from eccentrics, the valve gear under review adds the further one of freedom from link and slide-block.

TROLLEYBUSES IN PARIS.—The first suburban trolleybus line to be operated in Paris by the Compagnie du Chemin de fer Métropolitain de Paris was opened on January 18, 1943. It connects Porte de Champerret Metro Station (in the north-west of Paris), with the industrial suburb of Bérons, replacing a bus service which succeeded the trams in 1931. The introduction of the trolleybus in Paris was considered by the old Société des Transports en Commun de la Région Parisienne as far back as 1925, but the first trolleybus line was opened in 1933, connecting Vitry (Seine) Station with Place Cavé at Vitry. Early in 1940 the conversion of various bus services to trolleybus operation was contemplated. The activities of the S.T.C.R.P. were taken over on December 31, 1941 (in accordance with an agreement of June 26, 1941) by the Paris Metro (Réseau de Surface). The present trolleybus scheme for Paris envisages 19 lines which would result in a total route length of 80 miles, and involve an overhead route equipment (allowing for joint sections) of 73 miles.

Heavy Freight (War Standard) Beyer-Garratt Locomotive

Designed and built to the order of the Ministry of Supply for the War Department



THE tremendous transport demand which the war directly or indirectly has imposed on railways, has affected not only those of this country, but also many great systems overseas. Many little-known lines have assumed an importance, and have been called on to carry a traffic, which could never have been envisaged at the time of their inception. The unprecedented increase in traffic on some of these overseas lines is due not only to the transport of troops and all the paraphernalia of war, but also to the increased output of certain commodities and raw materials brought about by the loss of sources of supply in the Far East. Local industrial expansion and newly built strategic lines have further aggravated the position.

Despite every expedient in the more intensive use of locomotives, engine power has had to be augmented and the accompanying illustrations and description refer to a further type ordered by the Ministry of Supply, of which a number have already been built.

These locomotives, of the Beyer-Garratt articulated type, are of particular interest, as they are a war standard and designed for running on all 3 ft. 6 in. gauge lines in Africa of 60-lb. rail weight or over; the whole idea is that the engine shall have the widest possible application. The heavy grades and numerous and sharp curves of many of these railways, with their long mileages of single line, call for the heaviest possible train loads. The high tractive effort, large boiler, wheel arrangement, and coupled-wheel diameter meet these exacting conditions. The locomotive accordingly has been built to a maximum width of 9 ft. 6 in. and a total height to top of chimney from rail level of 12 ft. 6 in., and has an axleload of 13 tons. The tractive effort at 85 per cent. is 58,260 lb.—the total weight of the locomotive is about 150 tons—the locomotive thus ranking as one of the most powerful in the world on this gauge and weight of rail. The approximate loads in Imperial tons which the locomotive is capable of hauling are 450 tons on 1 in 40 grade (2.5 per cent.), 900 tons on 1 in 67 (1.5 per cent.), 1,300 tons on 1 in 80 (1.25 per cent.), and 1,750 on 1 in 100 (1 per cent.), at the economic speeds for the grade.

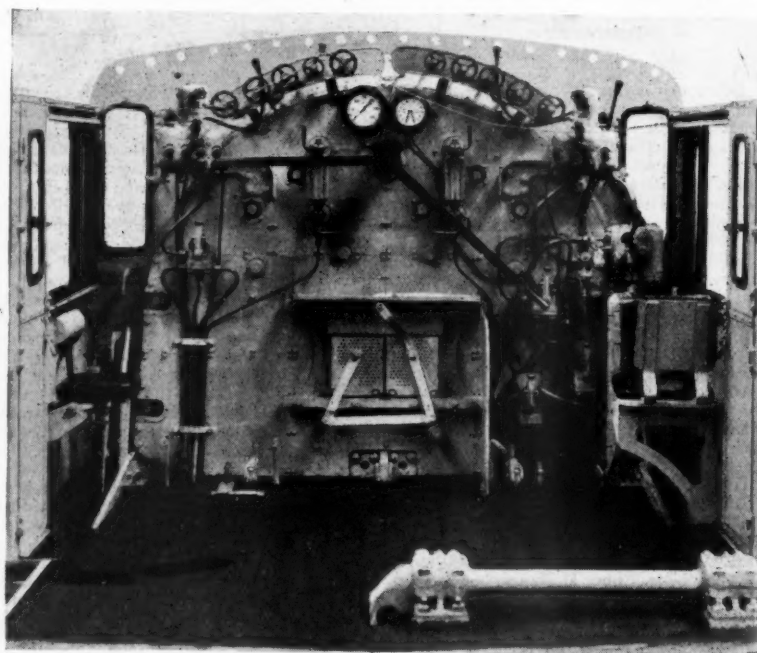
For speed in manufacture and economy in production, the general design has been based on a plate-framed Beyer-Garratt of similar wheel arrangement, of which a number has been running for some years, but the details of the whole locomotive have been thoroughly modernised and the latest practice incorporated for this type of engine. At the same time, frills have been eliminated and all eccentricities of design avoided and every

ing low-grade coal and wood, which are met with on the various railways. The draw-gear and buffing arrangement of the central type at each end of the locomotive have been so designed to enable the fitting of the various types of couplers in use, including the MCB type of automatic coupler. For engines fitted with automatic couplers, a suitable friction draft gear has been arranged.

The main frames of the engine units are of steel plates with cast-steel horn-blocks fitted with liners and adjustable wedges. Certain steel castings have been dispensed with, but substituted with stout built-up cross stays and racking plates to provide a chassis of adequate strength. The boiler is carried in the usual Garratt manner; the cradle has massive steel castings at each end, with which the female portion of the pivot is integral. The pivots are of the latest patent inverted type with adjustable segments and are oil lubricated. Side bearers are of the roller type, grease lubricated.

The Boiler

The boiler, of outstanding proportions, conforms to the customary Garratt shape and has ample heating surface for the four 19 in. x 24 in. cylinders it serves. The barrel diameter is 7 ft. outside and has a length between tubeplates of 11 ft. 8½ in. The boiler tubes are of steel and fitted with the Superheater Company's latest design of superheater. Safety valves are of the Ross pop type; there are two of 3½ in. dia. The round top firebox has an inner firebox of steel plates and radial stays; all the seams are welded. Four arch tubes are fitted. The



Footplate view of the locomotive

care exercised to cut down man-hours and avoid the use of materials in short supply or required more urgently for other war equipment. The boiler, as will be seen, has a firebox of the round-top type. The large grate area, 51.3 sq. ft., and firebox volume makes the engine suitable for burning the various classes of fuel, includ-

front rows of firebox crown stays, also the firebox side stays, in the breaking zones, are of the flexible type. The boiler is fed with two No. 11 Gresham & Craven injectors with 11½ mm. cones delivering through top-feed clackboxes supplied by quick-acting steam valves on the side of the firebox. Two Everlasting

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blow-down cocks are located at the front of the firebox and operated from the cab. The grate, which has a 14 in. slope, is fitted with rocking firebrars operated by steam cylinder. Hand drop grates are also provided. The ashpan is of the latest self-cleaning type with large emptying doors arranged to discharge the ashes between the rails. A 4½ in. air space is arranged between the ashpan and foundation ring, permitting extra air and dispensing with the usual arrangement of dampers. The smokebox is of the self-cleaning type, with deflection plates and equipped with wire-mesh spark arrestor and a hot-water ash ejector. Goodfellow tips are fitted to the blast pipe top.

Principal Dimensions

Principal Dimensions	
Cylinders (4), dia. x stroke ...	19 in. x 24 in.
Coupled wheels, dia.	3 ft. 9½ in.
Wheelbase, rigid	12 ft. 9 in.
Length over buffers	79 ft. 5 in.
Adhesive weight	104 tons
Boiler pressure	180 lb. sq. in.
Heating surface— Tubes	2,328 sq. ft.
Firebox (incl. arch tubes) 212 "	
Total evaporative	2,540 "
Superheater	470 "
Total	3,010 "
Coal capacity	9 tons
Water capacity	4,600 gal.
Traction effort at 85 per cent. b.p.	58,260 lb.
" " " 75 per cent. b.p.	51,140 lb.
Total weight in working order	150 tons

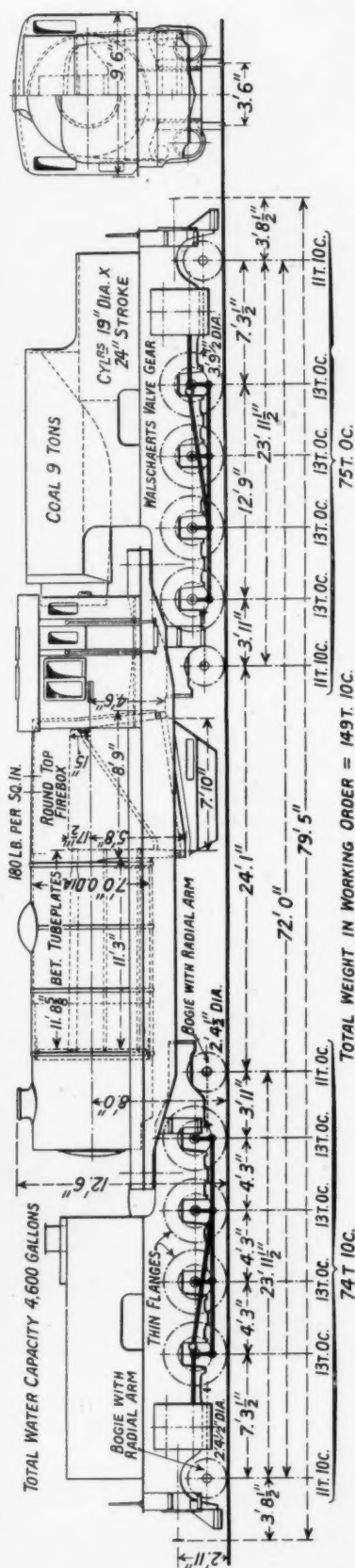
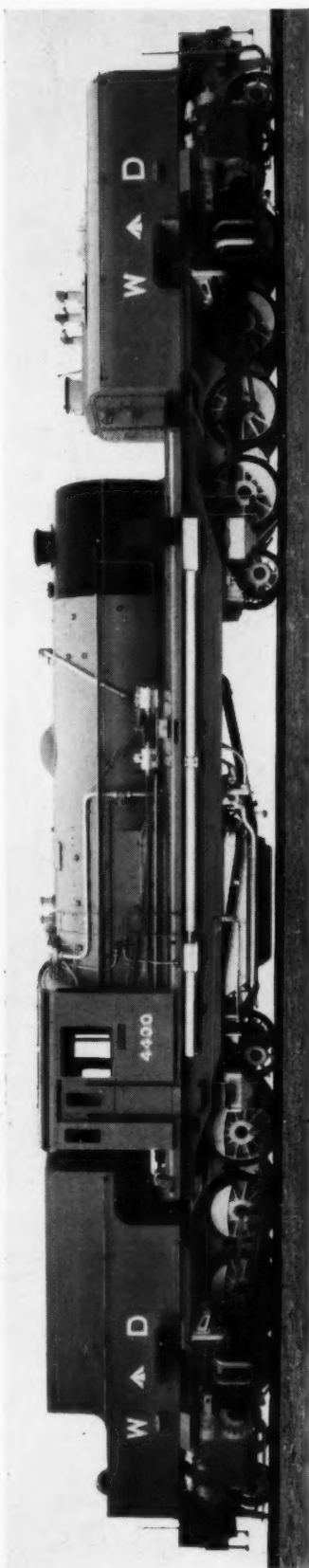
The cylinders have cast-iron pistons fitted with three narrow rings and drive the third pair of coupled wheels. United Kingdom metallic packing has been used for the piston rods. The piston valves are fitted with four rings and actuated by Walschaerts valve gear controlled by steam reversing gear with oil cataract locking cylinder. The valve gear is arranged similarly to recent engines of this type, that is, with both die blocks in the same half of the link for whichever way the engine is running. The crosshead arrangement is of the Laird double-bar type with underslung crosshead. The cylinders are provided with Hendrie bye-pass valves, snifting valves on the steam chest, water-relief valves, and a Sellar's steam drifting valve is fixed on the firebox and operated from the driver's position in the cab. Two 4-feed Detroit sight feed lubricators feed the high-pressure steam-ball joints, steam chests, and cylinder barrels of each engine unit. The steam and exhaust pipe layout follows the latest practice for this type of engine; the high pressure steam pipe to the hind engine unit passes outside along the boiler cradle, as can be seen in the illustration.

Engine Units

The 2-8-2 + 2-8-2 wheel arrangement has a rigid wheel base of 12 ft. 9 in. and the two middle pairs of coupled wheels have thin flanges. The engine is designed to negotiate 300 ft. radius curves.

Coupled axleboxes are steel castings with bearings, hub and side liners of bronze. The coupled springs are underslung with adjustable links and compensated in two groups, namely, outer truck and outer coupled—intermediate, driving, inner coupled, and inner bogie. The inner and outer bogies are identical and have radial arms with spring control. Bogie axleboxes with rocking brasses are oil lubricated. The coupled axleboxes are arranged for grease lubrication on the Ajax system, as are also the coupled wheel hubs, connecting and coupling rods, valve gear details, brake details, compensating beams, spring links, and side roller bearers.

Steam brake is arranged for all the coupled wheels and vacuum for the train
(Continued on page 597)



Heavy-freight (war standard) Beyer-Garratt locomotive, built to the order of the Ministry of Supply for the War Department



An illustration of one of the 100-wagon trains which are now being used by the Canadian National Railways to move vital war equipment at high speed from the factories to embarkation points

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RAILWAY NEWS SECTION

PERSONAL

Sir Thomas Royden, Chairman of the London Midland & Scottish Railway Company, and Lt.-Colonel the Hon. J. J. Astor, a Director of the Great Western Railway Company, have been re-elected Deputy-Chairmen of the Phoenix Assurance Co. Ltd. for the ensuing year.

Sir William Stanier, Chief Mechanical Engineer, L.M.S.R., who is on the staff of the Minister of Production in the capacity of a Scientific Adviser, has joined the board of the Garrard Engineering & Manufacturing Co. Ltd.

The Rt. Hon. Lord Leathers, Minister of War Transport, has returned to London from Washington.

Mr. J. Elliot, Deputy General Manager, Southern Railway, has been appointed by the General Managers' Conference to succeed Mr. R. Bell as Chairman of the managing committee of the Railway Research Service, of which Mr. C. E. R. Sherrington is Secretary, and Mr. E. D. Brant, Assistant Secretary. Mr. Elliot has been the Southern Railway representative on the committee since 1936, when he succeeded Mr. Bushrod.

Mr. D. C. Coleman, Chairman & President of the Canadian Pacific Railway Company, has been elected a Director of the Bank of Montreal.

We regret to record the death as the result of an accident, of Mr. C. H. M. Elwell, Assistant Mechanical Engineer (Outdoor), Doncaster, L.N.E.R.

Mr. H. G. Smith, Assistant to the Vice-President (Commercial & Operating), L.M.S.R., has retired from railway service, and from his position as Secretary of the Railway Companies' Association Commission on Postwar Planning & Reconstruction.

Mr. Napoleon Garceau, K.C., has retired from the Board of Transport Commissioners, Dominion of Canada.

Engineer Rear-Admiral Sir Robert Bee-man, who has been Engineering Manager of the company's Barrow Works since 1935, and Mr. A. J. Henden, General Manager of the Naval Yard at Walker-on-Tyne, have retired from the board of Vickers-Armstrongs Limited. Mr. Hubert Thompson and Mr. J. M. Ormston have been appointed Directors. Mr. Thompson, who for some years has been Commercial Manager at the Barrow Works, has been appointed Deputy to Sir James Callender, the General Manager of the works. Mr. Ormston, Shipbuilding Manager, Barrow, has been appointed General Manager Naval Yard.

Mr. Thomas Moll, Deputy-Chairman of the Grand Union Canal Company, has joined the board of Peradin Limited, and has been elected Chairman of the company.

Mr. C. H. Newton, Chief General Manager of the London & North Eastern Railway who, as recorded in our last week's issue, receives the honour of Knighthood in the King's Birthday Honours List, entered the service of the Great Western Railway in 1897, and obtained experience in various sections of the Chief Accountant's Office. He transferred to the former Great Eastern Railway in 1916, as Assistant to the Comptroller, and became, in 1919, Assistant

We regret to record the death on June 7, in his 64th year, of Mr. Samuel Jackson, M.I.Mech.E., M.I.Loco.E., a Director of Beyer, Peacock & Co. Ltd., and Works Director of Gorton Foundry.

INSTITUTE OF TRANSPORT COUNCIL

The following ordinary Members of Council will retire at September 30:—

Messrs. A. L. Castleman, London District Goods Manager, L.M.S.R.; G. F. Craven; B. England; S. H. Fisher, Assistant Chief Operating Manager, L.M.S.R.; C. M. Jenkin Jones, Divisional General Manager, North Eastern Area, L.N.E.R.; R. Leslie, Director, Central Argentine Railway Limited; R. M. T. Richards, Traffic Manager, Southern Railway; J. H. Turner; V. A. M. Robertson, Engineer-in-Chief, L.P.T.B.; and one Associate Member: Mr. M. A. Cameron, Assistant Goods Manager, Southern Area, L.N.E.R. To fill the vacancies created by the retirements, the council has nominated the following nine Members: Messrs. R. P. Biddle (Docks & Marine Manager, Southern Railway), Deputy Director of Ports, Ministry of War Transport; E. R. L. Fitzpayne, General Manager, Glasgow Corporation Transport; Brig.-General Sir Osborne Mance, Director of Inland Waterways, Ministry of War Transport; Messrs. L. H. K. Neil, London City Manager, L.N.E.R.; G. S. Rider, District Goods & Passenger Manager, Bristol, L.M.S.R.; R. A. B. Smith, President, Commercial Motor Users' Association; Major M. S. Speir, Chief Officer for Scotland, L.M.S.R.; Messrs. A. B. B. Valentine, Commercial Officer, L.P.T.B.; and W. Donaldson Wright, Divisional Road Haulage Officer, North Midland Region. One Associate Member: Mr. J. M. Leighton-Bailey, Outdoor Assistant to Superintendent of Operation, Southern Railway.



Elliot

[© Fry

Mr. C. H. Newton

Chief General Manager, L.N.E.R., who receives the honour of Knighthood

Accountant, and, in 1922, Chief Accountant. On the formation of the L.N.E.R., Mr. Newton was appointed Assistant Accountant of the company; he became Chief Accountant in 1928, which position he held until 1935, when he was appointed Divisional General Manager, Southern Area. He became Chief General Manager in 1939. The L.N.E.R. is the second largest of the four main-line companies. According to the latest figures available, the company owns 6,547 steam locomotives; 17,904 coaching vehicles; 258,162 goods vehicles; 11,191 service vehicles; 14 electric locomotives; 340 rail motor vehicles; 2 petrol-power shunting motors; and 24 steamboats. For the last full pre-war year (1938), gross receipts from railway and ancillary businesses and miscellaneous net receipts, as well as net receipts from joint lines, totalled £55,168,989; revenue expenditure on businesses carried on by the company, together with miscellaneous charges, amounted to £48,515,822; and total net revenue of the company was £6,653,167.

The Minister of Production has appointed Sir Robert Sinclair to succeed Sir Walter Layton as Chief Adviser on Programmes & Planning and Head of the Joint War Production Staff. Sir Robert Sinclair becomes also Chief Executive of the Ministry of Production. Sir Henry Self, Permanent Secretary to the Ministry of Production, succeeds Sir Robert Sinclair as the Minister's deputy and representative on the Combined Production & Resources Board.

Mr. John Cliff and Mr. Patrick Ashley Cooper have been reappointed members of the L.P.T.B. for a further term of five years from May 18.

We regret to record the death on June 3, at the age of 73, of Mr. C. A. Moore, who was General Manager of the Belfast & County Down Railway from 1912 until his retirement in 1926.

We regret to record the death, on May 30, of Mr. Robert Scorgie, M.B.E.,

who was Stationmaster, Glasgow (Central), L.M.S.R., from 1919 until his retirement in 1937. A portrait and biography of Mr. Scorgie appeared in our issue of April 30 of the latter year.

Mr. S. H. Scholes, Assistant to Superintendent for Organisation & Staff, Chief Commercial & Chief Operating Managers' Departments, L.M.S.R., who, as recorded in our May 14 issue, has been appointed Assistant (General), Labour & Establishment Office, Watford, entered the service of the former L.N.W.R. at Liverpool in



Mr. S. H. Scholes

Appointed Assistant (General), Labour & Establishment Office, L.M.S.R.

1905. After some station experience he was transferred to the Staff Office of the District Superintendent at Liverpool, and a few years later to the Headquarters staff Office of the Superintendent of the Line. After serving during the war of 1914-19 in the Royal Engineers (Transportation), he was appointed, after the amalgamation, to the Staff Office of the General Superintendent (Western Division). Mr. Scholes was made Assistant to the Staff Superintendent of the combined Chief Commercial & Chief Operating Managers' Departments in 1932.

SOUTHERN RAILWAY APPOINTMENTS

The Southern Railway announces the following appointments and retirement in the General Manager's Office with effect from June 1, 1943:—

Mr. W. George Pape, O.B.E., Indoor Assistant, to be Wartime Economy & Salvage Liaison Officer. He retains the title of Indoor Assistant.

Mr. A. J. Elmes to be Assistant for Railway Executive matters, General Manager's Office.

Mr. E. G. Trangmar to be Personal Secretary to the General Manager.

Mr. F. T. Pidding, Chief of Personal Section, retires.

At the annual general meeting of the Association of Consulting Engineers on May 27, an antique silver cup was presented to Mr. Ranald J. Harvey, M.Inst.C.E., M.I.Mech.E., M.I.E.E., on his relinquishment of the office of Joint Honorary Secretary, which he had held for over six years.

We regret to record the death on May 28, after a brief illness, of Mr. Walter Edward Bennett, F.C.I.S., A.M.Inst.T., who had been associated with the passenger road transport industry for some 44 years. He joined the secretarial department of the British Electric Traction Co. Ltd. in 1899, and in 1906 was appointed Secretary & Accountant to the British Automobile Development Co. Ltd., which in 1912 became the British Automobile Traction Co. Ltd., and in 1928 Tilling & British Automobile Traction Limited. The last-named change was a result of



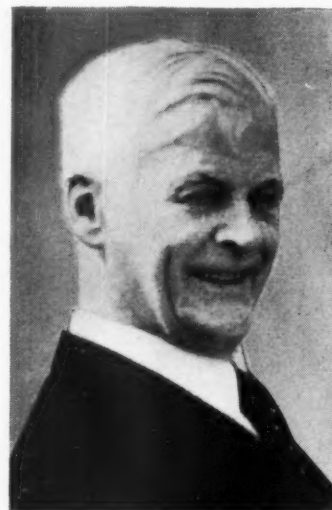
The late Mr. W. E. Bennett

Secretary, B.E.T. Omnibus Services Limited; Joint Secretary, National Council for Omnibus Industry

the closer association of interests in provincial bus companies of the B.E.T. and Thomas Tilling Limited. With the recent segregation of assets, Mr. Bennett was responsible for carrying through the scheme of reconstruction, and the liquidation of Tilling & British Automobile Traction Limited. He then rejoined the B.E.T. organisation and was appointed Secretary of the newly-formed B.E.T. Omnibus Services Limited. In recent years he had also held the position of Secretary to the Conference of Omnibus Companies, and since June, 1940, he had been Joint Secretary with Mr. Harold Clay of the National Council for the Omnibus Industry (the joint industrial council for the privately-owned bus industry of England & Wales). Further details of Mr. Bennett's career were published in our issue of June 28, 1940. Since 1929, most of the provincial undertakings with which he was associated have had substantial railway shareholdings and co-ordination working agreements between rail and road; Mr. Bennett was intimately associated with the completion of these arrangements.

We regret to record the death, as the result of the aircraft in which he was travelling being shot down on May 31, of Mr. Francis G. Cowrick, M.Inst.C.E., M.I.Mech.E., Member of the French Institute of Civil Engineers, Vice-Chairman of Sociedad Española de Construcciones Babcock & Wilcox. He was born in 1876, and went to South America as Assistant Engineer to Townsend Brothers, shipowners, before joining Babcock &

Wilcox Limited in 1898. In 1902 he became Chief Sales Engineer to Easton & Anderson, of Erith, but three years later returned to Babcock & Wilcox Limited as Manager for the Iberian Peninsula. With the formation of the Spanish Babcock & Wilcox company in 1918, Mr. Cowrick was appointed its Managing Director, and was responsible for the construction of the works and equipment, and for staff organisation, at Galindo (Bilbao); he was elected Vice-Chairman in 1927. He became a Director of the French Babcock & Wilcox company in 1928, and a member



The late Mr. Francis G. Cowrick

Vice-Chairman, Sociedad Española de Construcciones Babcock & Wilcox

of its executive in 1929. In 1930 he returned to the London Office of Babcock & Wilcox Limited to become Manager of the Associated Companies Department.

Mr. W. R. Fitzgerald, Deputy General Manager (Works), Bengal-Nagpur Railway, who, as recorded in our April 16 & 23 issue, has been appointed Agent & General Manager, was born in 1890. He studied the theory of engineering at Trinity College, Dublin, taking his B.A. and B.A.I. degrees, before undergoing his practical training as a pupil on the Great Northern Railway (Ireland). From August, 1913, until June, 1915, he was an Assistant Engineer on the Egyptian Delta Light Railways; he obtained a commission in the Royal Engineers in the latter month, and saw service in Mesopotamia and India. On demobilisation, he was appointed Assistant Engineer, Bengal-Nagpur Railway, in October, 1919. After obtaining experience in survey and construction work, Mr. Fitzgerald was promoted to be Superintendent, Maintenance, at headquarters in 1923. On his return from leave in 1925, he held successively the appointments of District Engineer, Projects & Developments; Superintendent, Development; and First Personal Assistant & Secretary to the Agent. Mr. Fitzgerald was a Temporary Deputy Manager from 1929 to 1933, when he was promoted permanently to be Deputy General Manager (Works).

Dr. Kenneth E. Dowd has been appointed Chief Medical Officer, Canadian National Railways, in succession to Dr. J.

McCombe, who has retired, but who will continue to act in a consultative capacity.

Mr. R. J. Ellery has been appointed Secretary of B.E.T. Omnibus Services Limited in succession to the late Mr. W. E. Bennett.

The Second Supplement to *The London Gazette* of May 7 announces that the King has awarded the Imperial Service Medal to 15 employees of the Railways Department New South Wales.

Mr. S. R. Nicholas, Assistant Secretary, New South Wales Government Railways, who, as recorded in our March 26 issue, has been appointed Secretary, entered the Department of Railways in 1900, and was appointed Information Officer in 1927; Assistant Secretary in 1930; and Acting Secretary for Railways in 1940. For the last twelve years he had held, in addition, the position of Secretary of the Australian and New Zealand Railway Conferences, an office which he now has vacated. During the war of 1914-19 Mr. Nicholas was on military leave for three-and-a-half years. In 1935 he accompanied Mr. T. J. Hartigan, Commissioner for Railways, on a tour abroad.

The King's Birthday Honours List

Among the honours announced in the King's Birthday list were the following of transport and industrial interest:—

Privy Councillor

Mr. Harcourt Johnstone, M.P., Parliamentary Secretary, Department of Overseas Trade.

Knights Bachelor

Mr. John Craig, C.B.E., J.P., D.L., Chairman & Managing Director, Colvilles Limited.

Mr. Archibald McKinstry, M.I.E.E., M.I.Mech.E., Deputy Chairman & Managing Director, Babcock & Wilcox Limited.

Mr. Charles Henry Newton, Chief General Manager, London & North Eastern Railway.

K.C.B. (Civil Division)

Sir William Scott Douglas, K.B.E., C.B., Permanent Secretary, Ministry of Supply.

K.C.M.G.

Mr. Hugh Cholmondeley Thornton, C.M.G., Senior Crown Agent.

C.M.G.

Mr. Gerald Henry Avezathe, Ministry of War Transport Representative in Lagos.

Mr. Charles Eustace Rooke, General Manager, Nigerian Railway.

Mr. Gilbert Shaw Whitham, C.B.E., Director-General, Production Services, Ministry of Supply. Lately Head of British Technical Mission in Turkey.

C.I.E.

Mr. Leslie Neeve Flatt, V.D., Director of Mechanical Engineering, Railway Department (Railway Board), Government of India.

Mr. Tehmus Temulji Kothavala, Secretary, Provincial Transport Authority, Bombay.

Mr. Richard Lean, Chief Mechanical Engineer, Madras & Southern Mahratta Railway, Madras.

Mr. Stewart Ellis Lawrence West, O.B.E., V.D., Director of Traffic, Railway Department (Railway Board), Government of India.

C.B.E. (Military Division)

Colonel Francis John Wymer, Southern Railway Home Guard. Colonel Wymer is Assistant (Planning) to General Manager, Southern Railway.

C.B.E. (Civil Division)

Mr. Vivian Buchanan Atkinson, Chief Engineer, Kenya & Uganda Railways & Harbours.

Brig.-Gen. Atwell Charles Baylay, D.S.O., Chairman, Engineering & Allied Employers' Association, Birmingham, Wolverhampton, and Stafford District.

Mr. W. L. Best, Ottawa, Legislative Representative, Brotherhood of Locomotive Firemen & Enginemen.

Mr. Kenneth Lancelot Macaulay, O.B.E., Finance Officer, Ministry of War Transport.

Mr. Donald MacNaughton Macrae, O.B.E., British subject resident in Buenos Aires. Mr. Macrae is General Manager of the Central Argentine Railway Limited, and a member of the British-Argentine Railway Committee in Buenos Aires.

Mr. Arthur Joseph Palmer, Director, Vickers-Armstrongs Limited.

Captain Bernard Hartley Peter, Board of Trade Representative, South Western Regional Board. Chairman, Railway Brakes & Signalling Export Group.

Mr. Allan Stephen Quartermaine, M.C., Chief Engineer, Great Western Railway.

Mr. Vernon Alec Murray Robertson, M.C. (Col. R.E., T.A.), Engineer-in-Chief, London Passenger Transport Board.

O.B.E. (Civil Division)

Mr. Wilfred Temple Aldous, V.D., J.P., Chief Traffic Manager, B.B.C.I.R., Bombay.

Mr. A. Hector Cadieux, Montreal, Head, Canadian Pacific Railway Police.

Lt.-Colonel John William Clarke, Special Railway Magistrate, Allahabad, United Provinces.

Mr. Reginald Hugh Faro, Chief Engineer, Pickfords Limited.

Mr. Ronald Churchill Ivey, Deputy Transportation Superintendent, G.I.P.R., Bombay.

Mr. Herbert Joseph Longley, Manager, Gresham & Craven (India) Limited, Entally, Calcutta.

Mr. Frederick Harold Dunn Page, Signal Engineer, Great Western Railway.

Lt.-Colonel John Norman Peck, M.C., District Civil Engineer, London, London Midland & Scottish Railway.

Mr. George A. Shea, Montreal, Head of Canadian National Railways Police.

Mr. Robert Stuart, British subject resident in Buenos Aires. Formerly General Manager, Bahia Blanca & North Western Railway, and member of the Local Committees, B.A.G.S.R. and B.A.W.R.

M.B.E. (Civil Division)

Mr. Joseph Waugh Bulman, Superintendent, Cyprus Railway.

Mr. Wilfred George Bunyan, Assistant Works Manager, Bengal-Nagpur Railway Workshops, Nagpur.

Miss Helen Catto, Chief Welfare Superintendent (Women), London Midland & Scottish Railway.

Mr. William Thomas Chappel, District Locomotive Superintendent, Kenya & Uganda Railways & Harbours.

Mr. Robert Cogger, Outdoor Assistant, Signals & Telegraphs, London, Southern Railway.

Mr. James Croal Craig, Stationmaster, Edinburgh (Waverley), London & North Eastern Railway.

Mr. Albert Vivian D'Costa, Assistant Executive Engineer, G.I.P.R., Bombay.

Mr. Andrew Mervyn Dibble, Assistant Engineer, Public Works Department, Northern Rhodesia.

Mr. Huntley Strathearn Gordon, Welfare Officer, London Passenger Transport Board.

Mr. Christopher Joseph Gregory, Stationmaster, Liverpool Street, London & North Eastern Railway.

Mr. Sasanka Sekhar Gupta, Assistant

Superintendent, Way & Works, Sahebganj, E.I.R.

Mr. John Hannah, District Mechanical Engineer (Munitions Officer), Bengal & Assam Railway, Kanchrapara.

Mr. Joseph Harrison, Stationmaster, Euston, London Midland & Scottish Railway.

Mr. John Begby Haskins, Resident Engineer, Oudh & Tirhut Railway, Benares.

Mr. Khanchand Bhopatrai Hira, Divisional Executive Engineer, N.W.R., Karachi.

Mr. P. J. McTaggart-Cowan, Montreal. For valuable work in connection with air transportation, under the Department of Transport.

Mr. John Arthur Meneze, District Signal Engineer, E.I.R., Moradabad.

Mr. William Arthur Murray, Signal Engineer, Oudh & Tirhut Railway, Gorakhpur.

Mr. Harry Nodder, Assistant Divisional Engineer, Plymouth, Great Western Railway.

Mr. Percy William Earl Thatcher, Wharfinger, Southern Railway; Secretary, Port Emergency Committee, Southampton.

Mr. Bernard Francis Twiney, Assistant Chief Accountant, Sudan Railways.

British Empire Medal (Civil Division)

Mr. Percy Mozart Bailey, Ganger, Kettering, London Midland & Scottish Railway.

Mr. Teophile Balian, Machine Shop Chargeman, Palestine Railways.

Mr. John Embury Battin, Goods Foreman, Birkenhead, Great Western Railway.

Mr. Albert Victor Bennett, Signal & Telegraph Supervisor, Eastleigh, Southern Railway.

Miss Gertrude Eileen Cooper, Telephone Supervisor, Southampton Docks, Southern Railway.

Mr. Charles Cranfield, Night Foreman, Camberwell Garage, London Passenger Transport Board.

Mr. Frederick George Ellingham, Ganger, St. Pancras, London Midland & Scottish Railway.

Mr. Charles William England, Goods Agent, Portsmouth, Southern Railway.

Mr. Joseph Victor Harold Gurney, Station- & Yardmaster, Banbury, Great Western Railway.

Mr. William Henry House Harper, Able Seaman (Acting Boatswain), Southern Railway.

Mr. Frederick Hawkins, Blacksmith, Wolverton, London Midland & Scottish Railway.

Mr. William John Hover, Supervisor of Steel Structures, London, Southern Railway.

Mr. Edward Keightley, A.R.P. Travelling Inspector, London Midland & Scottish Railway.

Mr. Joseph Law, Works Inspector, Watford, London Midland & Scottish Railway.

Mr. Thomas Blackburn Maddison, Acting Foreman, Machine Shop, Darlington, London & North Eastern Railway.

Mr. Gordon Percy Albert Marsh, Charge Engineer, Ferry Dock, Dover, Southern Railway.

Mr. Horace Melbourne, Chief Cartage Supervisor, Marylebone, London & North Eastern Railway.

Mr. James Nutty, Fitter, Derby, London Midland & Scottish Railway.

Mr. David Plumbley, Docker, Garston, London Midland & Scottish Railway.

Mr. George Pointer, Driver (Central Buses), London Passenger Transport Board.

British Empire Medal (Civil Division)

Foreign Services

Mr. Charles Claud Hollick, Wagon Shop Foreman, Iraqi State Railways.

TRANSPORT SERVICES AND THE WAR—193

Typical Railway Women

Representative of the wartime contribution which women are making to railway operation, is the recently-issued statement that nearly 200 women are now engaged at Oldham Road Goods Depot, L.M.S.R. They drive overhead cranes, load timber, load and unload wagons, and act as stablewomen to many of the 800 horses in the Manchester area. The ages of the women at this depot range from 17 to 66.

More London Gas-Producer Buses

On June 1, 39 more gas-producer buses went into service on London Transport routes around London; 35 of such vehicles were previously working, 24 in the Gray's area, 8 on Epping routes, and 3 in Central London. There are thus now 74 at work. The full programme is for 550 vehicles, most of which are to operate on Central London routes. It is expected that an eventual saving of 3,500,000 gal. of petrol a year will result from running this fleet of producer-gas buses.

Summer Time and the Bus Curfew

For many weeks past there have been various requests, principally from municipal bus undertakings, to lift the curfew ban (or extend the hour of its imposition) during the operation of double summer time. At present, journeys made after 9 p.m. (or in some cases 9.30 p.m.) are restricted to priority passengers, and it is found that often the vehicles are running lightly loaded. The Ministry of War Transport has stated that the need to economise in the use of imported fuel and rubber is as great as ever, and that therefore it is impossible to relax the restrictions imposed to discourage unnecessary travel.

London Transport Railway Women

Just over 11,000 women have now replaced men in the service of the London Passenger Transport Board as porters and booking clerks on the Underground, in a wide variety of engineering work, and as conductors on buses, trams, and trolley-buses. There are 750 porters, 550 booking clerks, and 7,500 women conductors. Engineering grades employ 3,300 women.

The training of women as porters is not complex. Classroom work at the Training Centre at Lambeth North Station lasts about three days, and includes instruction in the topography of the board's area and its transport systems, particularly the railways. On dummy telephones, the pupil practises sending messages. She is also taught how to deal with the many posers which passengers will put to her. Class training is followed by a further three days of practical experience, under supervision, at a station. In the Training Centre, an improvised booking office, containing every type of ticket-machine, is installed. Here, women training as booking clerks practise the issue of tickets to one another. The course for booking clerks lasts about a month, namely, one week at the school and three weeks at a station.

The porter's uniform originally comprised one tunic, one divided skirt, one cap, and two overalls (wrap-over type), but the issue of tunics and skirts has been discontinued. The overalls are issued as a protection for uniforms while staff are engaged on cleaning work. The present issue of clothing is as follows: On appointment, one overcoat, two dust-coats, two pairs slacks, one cap, two overalls (wrap-over type); thereafter, the rate of replacement is one overcoat every three years,

one dust coat every sixteen months, one pair slacks every year, one cap every two years, and one overall every sixteen months. All women conductors and porters surrender coupons at a special rate, which has been determined by the Board of Trade.

Porters begin at a wage of 62s. 6d., rising after three months to 66s. 6d. The maximum of 68s. 6d. is reached after a further two years. Booking clerks, mostly women over 30 years of age, receive a wage of 78s. 6d. In a few cases, women who were conductors and booking clerks during the war of 1914-19 have been re-employed.

Week-end Home Guard Trains

In connection with week-end training camps which have been arranged for the Manchester Home Guard, the L.N.E.R. has put on special trains to take the men to camp on Saturday and bring them back on Sunday evening throughout the season. The first train left London Road Station, Manchester, on May 29. The camping season will last until the end of September. This is the first time that such railway facilities have been placed at the disposal of the Home Guard.

Restricted Use of Hired Cars

Tighter control of hired motorcars came into force on June 7 under the new Control of Motor Fuel Order, 1943, issued by the Minister of Fuel & Power. Hitherto, the motorcar hired with or without a driver might be used without restriction within the inner radius of 10 miles from the place where the vehicle was normally garaged. Now, the hirer of a car without a driver may be furnished with motor fuel for a journey within such inner radius only for a permitted purpose. This is defined as either a journey required for the hirer's urgent domestic purposes, or for purposes in connection with essential services being performed by the hirer where other means of travel are not reasonably practicable. The unrestricted use of a car hired without a driver within a radius of 10 miles is thus eliminated.

Journeys outside the inner radius of 10 miles and within the outer radius of 75 miles may now be made only for the two permitted purposes already specified, whether the car is hired with or without driver.

Motor fuel may not be supplied for a vehicle hired for more than three consecutive days, or for more than six days in any month (whether consecutive or not), by the same proprietor to the same hirer. For this purpose the hirer is regarded as including members of the same household, and persons in partnership with him in any undertaking, and his agents or servants.

Air Raiding and Italian Transport

It is reported through Swedish sources that Italian railways and roads round the much bombed cities of Naples, Milan, Turin, Palermo, and Messina, are congested with refugees seeking safety in surrounding villages. In addition, many persons endeavour to sleep well outside the cities, and to travel in daily for business purposes. Serious congestion is said to have resulted, and it is reported that barely 50 per cent. of the travellers are paying their fares, because of the difficulty of checking tickets in overcrowded trains with much reduced railway staffs. According to an article in an Italian newspaper, travellers arriving at Milan Central Station every morning between 7 and 8 o'clock, have increased from 9,000 daily to 20,000; the total daily



Major-General D. J. McMullen and Mr. R. A. Riddles, Deputy Director-General of Royal Engineer Equipment, Ministry of Supply, on the occasion of the delivery of the new Beyer-Garratt war freight locomotive of which details are given on page 588

arrivals are said to have risen from 38,000 to 65,000. The situation is believed to be considerably worse in the south of Italy.

Women on Japanese Railways

Women are to be employed on Japanese Railways, according to a German radio announcement of June 1. A special centre is said to have been established to train women for work which hitherto has been undertaken exclusively by men.

Railway Control in Norway

The Norwegian Departments of Trade and of Supply were merged into one department, known as Department of Economics, on April 1. Its seventh section, formerly the Directorate of Communications of the Department of Trade, has been charged with responsibility for all matters concerning railways, shipping, road traffic, and commercial aviation in Norway.

Women on Soviet Railways

Recently, 28 of the best women locomotive drivers on the Soviet Railways were awarded orders and medals. A Ukrainian woman driver, Maria Tishko, who works on a railway in the front-line zone, recently drove her one-hundredth train loaded with ammunition through to the front. One of the locomotives on the Omsk Railway is regularly driven by Ekaterina Novitskaya, the initiator of a movement among Siberian women to learn specialised railway work.

Increased Moscow-Leningrad Traffic

During the last week in May, a considerable increase was reported in the railway freight traffic between Moscow and Leningrad. A large quantity of products from Leningrad factories has been dispatched to Moscow and the latter has sent industrial goods in return.

Western Australian Railways

In the report of the Western Australian Government Railways for the year ended June 30, 1942, it is stated that owing to defence requirements it was necessary to

curtail civilian interstate travel, and a system of priority travel was introduced between Western Australia and the Eastern States. Under this system only essential travel is permitted and as a result civilian passenger journeys over the section between Perth and Kalgoorlie have been materially reduced.

An ambulance train has been fitted out and equipped to the order of the Commonwealth. The train has a capacity of 287 cots and other appurtenances fitted into nine ward cars and brakevan; the remaining four coaches fitted with all conveniences are used as dining car, administrative car, staff car, and car for personnel. Since issue six cars have been equipped with lavatories and the number of cots reduced by fifteen.

A number of "V" vans has been fitted with seats and these are being used for short-distance military trains.

Abandoned U.S.A. Railway for Salvage

The Chicago & North Western Railway has recently abandoned its 103-mile single-track line between Linwood and Hastings, in Nebraska, in order to make available rails and other materials for track construction in military establishments. Some 99 miles of the line have been dismantled, and about 3 miles within the limits of the city of Hastings have been sold to the Missouri-Pacific Railroad. The abandoned line, which was built in 1888, through the agricultural district of the so-called South Platte area of Nebraska, was for many years a profitable feeder for the C. & N.W.R. but road transport developments and competition from other railways have reduced its value, and the C. & N.W.R. has sought to abandon the line on more than one occasion, but unsuccessfully until December 24, 1941, when authority was granted by the Interstate Commerce Commission in view of war needs. All the rails were requisitioned by the Metals Reserve Company, a subsidiary of the Reconstruction Finance Corporation, for Navy depot track construction. In addition, large quantities of metal and timber have been recovered for further use, or sold for scrap.

C.P.R. Staff Enlistment

Recent statistics showed that 16,430 out of some 73,000 C.P.R. employees are in uniform, and 184 others on loan as technical experts for war enterprises. Of these, 8,840 are from the railway, and 5,591 from the company's steamships.

C.P.R. Broadcast for Victory Loan

The largest private broadcast in Canadian radio history was made by the Canadian Pacific Railway when Mr. W. M. Neal, Vice-President, from his desk in the

Windsor Station offices, made a stirring coast-to-coast broadcast appeal to the company's employees to subscribe to the fourth Victory Loan. The company's target is \$5,300,000 from officers and employees. The objective of the loan is \$1,100,000,000 for all Canada. Mr. Neal was heard over the most extensive private network in the history of Canadian communications, involving a double-line circuit of 7,269 miles of copper wire. A French version of his appeal was broadcast by Mr. L. G. Prevost, K.C., of the company's law department. This C.P.R. objective is \$1,000,000 more than that of the last campaign, and compares with \$3,654,000 in the second loan, and over \$2,000,000 in the first loan. A committee under the chairmanship of Mr. Neal is directing the activities of sub-committees in all communities throughout the company's lines. Commenting on this railway effort, the *Montreal Gazette* said: "The objective is a high one, but not beyond the reach of officers and employees, who together have already subscribed for \$10,203,500 in the first three campaigns."

Suggested Railway to Alaska

The possibility of a railway traversing Canada from the United States border to Alaska emerges from a suggestion made in Washington by United States Secretary, Mr. Harold Ickes, who, during testimony before a House of Representatives sub-committee on the Interior Department's new appropriation bill, said he favoured the construction of an elevated railway to Alaska. He had approved the suggestion that a second Alcan Highway be built after the war, but added: "I would be inclined to suggest to the Army Engineers that, instead of another highway, they build an elevated railway all the way across Canada and Alaska so that they would not have all this trouble about snow and ice, bogs, and all that sort of thing. Originally, they would have to use wooden piles to carry the line."

Brazilian Railways and the War

As a result of the recognition of a state of war between Brazil and Germany and Italy, emergency measures include a Decree-Law enacted by the Brazilian Government providing for the requisitioning of movable and immovable property necessary for the armed forces and for the passive defence of the people. Article 16 of this refers to the requisitioning of railways and states, *inter alia* :—

In the cases provided for in Art. 2 of this law, railway companies on being requisitioned are obliged to place at the disposal of the War Ministry the whole of their resources in materials and personnel,

including station buildings and permanent way, their source of energy and motive power, their workshops, stored materials and stocks necessary for use in the working of the systems, telegraph and telephone lines and telegraph or telephone stations, wireless or otherwise.

In the event of mobilisation, or when the political order and economy of the nation so demand, the Federal Government may decide that the entire railway services, or part thereof, be subordinated to the military authorities, under the general control of the War Ministry. In such case, the personnel and material of the railways may be used without distinction of company or system.

The Victoria to Minas Railway

The successful exploitation of the enormous reserves of manganese at Itabira (Brazil) has always been subordinate to the question of transport, and, although numerous attempts have been made to show that economical transport is possible by way of the Central Railway to the port of Rio de Janeiro, it has always been maintained by unbiased technical authorities that the only satisfactory means of development is by transport over the Victoria to Minas Railway to the port of Victoria. The rehabilitation of this line, in wartime conditions, has been referred to in these columns on a number of occasions (notably in our issues of January 29, page 122, and February 5, page 150). Further particulars are now to hand from our correspondent in Brazil. The Victoria to Minas Railway was built under a policy of cheap construction, embodying curves with a minimum radius of 100 metres, and maximum gradients of 1 in 33. The line was laid across country from Victoria to Collatina, a distance of 150 km., and thence by the banks of the Rio Doce to Presidente Vargas, some 30 km. from Itabira. The first part took four years to build, and a further three years were consumed on the construction up to Governador Valadares at km. 350; only some time later was the line completed up to Presidente Vargas, and the joining up of the railway with the Central of Brazil Railway at Sabara is quite a recent accomplishment.

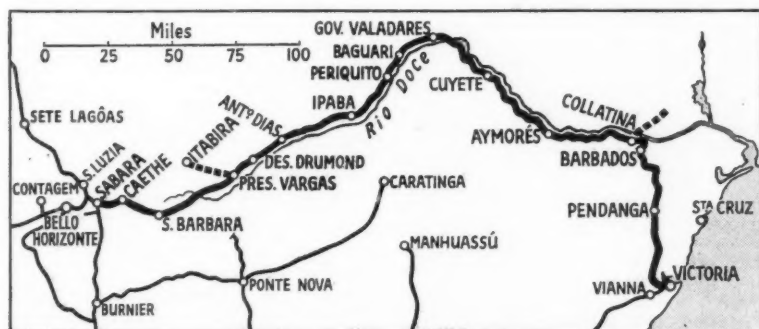
The whole layout has now to be revised, and a time limit of 12 months has been fixed for the execution of alterations which will place the railway in a position to handle the 3 million tons or more of iron ore necessary for war requirements. The following modifications are to be made without delay :—

Remodelling the track from Barbados to Desembargador Drumond;

Constructing an extension from Desembargador Drumond or Presidente Vargas to Itabira, a distance of about 36 km.

Constructing a line from Barbados to the port of Santa Cruz, some 90 km.

The new contract stipulates the adoption of minimum radii of 200 metres, and maximum gradients of 1 in 66, but the latter will be allowed only in exceptional cases on branch lines. In the direction of export (from Drumond to Victoria) the maximum adverse gradient is to be 1 in 200, and in the opposite direction 1 in 85. The existing stations on the Victoria to Minas railway are on an average 15 km. apart. For the heavy traffic intended, this distance is too great for a single line. With average throughout speeds of 20 km.p.h., the running time between stations must not exceed 27 min. if a total of 25 trains a day is to be obtained. To meet such requirements, 40 new stations are to be added to the 42 already existing, and siding accommodation at each will permit of the crossing of three trains at a time.



Sketch map of the Victoria to Minas Railway, Brazil, which is undergoing extensive rehabilitation to meet wartime needs

Staff and Labour

Railway Wages

A stage in the negotiations between the Railway Executive Committee and the railway trade unions on the claim for an increase of 10s. a week took place on Monday, May 31, when representatives of the Railway Executive Committee met representatives of the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen and the Railway Clerks' Association in London. The official announcement states that the matter was discussed and deferred for further consideration of the position but it is understood that an offer was made on behalf of the Railway Executive Committee, the amount of which was not stated.

Imperial Chemical Industries Limited

The 16th ordinary general meeting of Imperial Chemical Industries Limited was held on May 27 at Nobel House, Buckingham Gate, S.W.1. The Rt. Hon. Lord McGowan, Chairman of the company, presided.

The Chairman, in the course of his address, said:—The intensification of the war during 1942 raised to still higher levels the pressure of demand for the products of our factories. They have worked to full capacity throughout the year. Considerable quantities of exports have been safely carried through all perils to their destinations. In maintaining supplies for our export markets we have once more benefited by the willing assistance afforded us by our subsidiary and associated companies in the British Empire as well as by the same efficient help from our American friends, notably E.I. du Pont de Nemours & Company, of Wilmington, U.S.A. Our business with Far Eastern markets remains practically at a standstill, but we are giving much study to the problems which will arise after the war, both there and in other overseas territories.

We are convinced that British industry must be prepared to invest much more generously than in pre-war days in research and development. For years past we have spent considerable sums, but we are at the present time considering a marked post-war expansion of the company's scientific staff, its laboratory accommodation, the necessary experimental engineering shops, and all other branches of this work.

From the early days of the war the Government has drawn heavily on our executive and senior staff to fill administrative and technical posts of great importance; many of our leading technicians and scientists have also been seconded for service with the United States, Canada, Australia, and Africa to assist in their war production; specialists from I.C.I. have also been called upon to carry out missions to Russia, China, Central Asia, Malta, and elsewhere. In all, 2,500 of our staff, foremen, and technicians have been placed at the disposal of Britain and the Allied Nations for these purposes.

The post-war future is clouded with uncertainty for everyone. Of only one thing can we all be sure—that for some years conditions for trade and industry will be subject to varying measures of State control. Whatever measure of international co-operation may be achieved in the future, no instrument of progress and prosperity has yet been found to equal private enterprise in

originality, celerity, or accomplishment. International trade is of vital importance to us and we shall welcome every step to facilitate its freedom and extension. Above all, we are convinced that our own international trading position must rest upon a high efficiency of production springing out of persistent research for new methods and new products, accompanied by that initiative and speed of action which private enterprise alone can provide.

The report and balance sheet were adopted unanimously.

Army Railway Construction and Operation

By courtesy of the War Office a party of press representatives was enabled, on June 1 and 2, to view the work of military units in connection with the construction and operation of army stores depots. Some information was given as to the origin of the present considerable number of Transportation Service Units. Details were also given of the procedure followed in the provision of stores depots from their original inception to their handing over on final completion to the using services. This involved much consultation with services concerned, reconnaissances by Transportation Directorate, surveying and mapping by the Railway Survey Companies, preparation of earthwork and formation by Mechanical Equipment (Tn) Companies, trackwork in all its various detail by Railway Construction Companies, with assistance and help as required from Railway Bridging Companies, and operation of trains by Railway Operating Companies. All these units belong to the Corps of Royal Engineers and form part of the Transportation Service.

The installation and maintenance of telephones and electrical signalling instruments is carried out by Railway Telegraph Companies of the Royal Corps of Signals. All other works in the depots such as construction of storage sheds and stacking areas, provision of office and living accommodation for the using service, construction of roads, the provision of supplies of water and electricity, and the installation of sanitary drainage are carried out by the Royal Engineer Works Service.

The party was enabled to see every branch of the railway work noted above being carried out on the ground in a depot under construction and in another which had been completed and was in full operation. A more detailed description of this visit will appear in these pages next week.

Parliamentary Notes

Railway Freight Rebates Bill

The Railway Freight Rebates Bill was considered in committee by the House of Commons on June 2.

On the motion that Clause 1 (Suspension of Coal Rebates) stand part of the Bill,

Sir Herbert Williams (South Croydon—C.) said he put down on Second Reading a reasoned amendment for the rejection of the Bill, not because he objected to it, but because he did not like the way it was drafted. The Bill proposed to use for other purposes money which became available to the railways under the Derating Act, 1929. He believed that about £1,500,000 a year was involved, which was designed to reduce rates on coal for export and certain agricultural produce. For the moment, the money was not wanted for that purpose. The ordinary way would have been to let it fall back to the Treasury; but when the Ministry of Fuel & Power

saw £1,500,000 lying about it thought they would like to have it, and, by arrangement with the Ministry of War Transport it decided to appropriate it to do as it liked with, without any questions asked. He thought that to allow it to appropriate this money without any effective control by the House of Commons was not good enough.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary to the Ministry of War Transport) said that the main purpose of the Bill was contained in Clause 1. It was the basis of the working of the railway freights scheme. That scheme was introduced to help certain depressed industries in 1938 and subsequent years. Those industries were the coal industry, the agricultural industry, and the iron and steel industry. By a later Act the scheme was confined to coal and agriculture, the agricultural products being milk and livestock. The Act had continued to work as Parliament intended in the case of agriculture. For export coal it had not continued to operate as Parliament intended, because our export of coal had greatly declined. There was still, technically, some export of coal, for bunkers and fishing vessels, and a certain amount, though very little, for foreign countries. The rate of rebate was very high, but even so all the amount had not been used, and there was a large balance in hand. For that reason, and because it was actually undesirable that the original purpose of Parliament should be carried out, to encourage coal export and the transport of coal by rail, the Minister of War Transport thought it better to suspend the working of this scheme so far as coal rebates were concerned until the end of the present emergency, and, with the agreement of all concerned, not only in the Government but in the industry itself, this plan had been put forward. The agricultural scheme continued to work as before the war, and it would continue. Coal was not to be indemnified at the expense of agriculture.

The Clause was agreed to.

On Clause 2 (Payment to the Minister of Fuel & Power of amounts corresponding to amounts of suspended rebates).

Mr. Noel-Baker moved an amendment to make it plain for what purposes the money should be used, and to ensure that the Minister could not use it for any purposes except purposes similar to those they had now in view. The purposes, he said, were two. First, they intended that part of the money should be paid into the Coal Charges Account. The committee would remember that under the Coal Charges Order the Minister of Fuel & Power was authorised to impose a national levy on the coal industry, which was now standing at a level of 5s. a ton and under which the Minister raised no less than £50,000,000 a year. By means of that levy he had set up the Coal Charges Account, and out of that account he maintained a reasonable national credit balance for the industry as a whole. By so doing and by keeping each district in the industry financially on the right side, he prevented rises in the price of coal to the consumer. That account was very finely balanced, and if any large sums were constantly withdrawn from the receipts of the coal industry, the balance might be upset, and a rise of prices to the consumer might result. By the suspension of the coal rebates by this Bill a considerable sum would be withdrawn from the receipts of the industry, because there was still a certain amount of coal being moved. The rate of rebate was very high, and the coal industry would lose by this Bill in a full year about £500,000. The Government intended therefore that the Minister of Fuel & Power should pay £500,000 from the

money now being made available in the Coal Charges Account so that he might keep a reasonable national credit balance in the account and thus prevent a rise in prices to the consumers of coal.

The second purpose for which they intended the Minister should use this money was this: They had been obliged in the national interest—it had been done in his Ministry—to make arrangements about the transport of coal which were not, by normal standards, economic. They had had to carry a lot of coal by coaster, which was very expensive. To prevent the extra cost falling on the consumer the Government had paid £2,000,000 on that item alone. Similarly, they had to carry coal by rail for long distances to certain places, which normally would have drawn their supplies from nearer sources, such as, for example, Durham to the North of Scotland. The Government had paid a subsidy amounting to £1,000,000. That subsidy of £3,000,000 for transport charges the Minister of Fuel & Power now bore on his Vote. They proposed that the remainder of the money realised by this Bill from the Freight Rebate Fund should be used by the Minister to meet the cost of those subsidies. On present estimates, in a full year the sum would be about £800,000, against the £3,000,000 which he had to pay. That was to say that for the two purposes he had described the Minister would use the sum of £1,300,000 he was now going to receive from the fund. The committee would see that those two commitments would use up the whole of the money available so long as present conditions lasted. Perhaps Sir Herbert Williams would say, if he were present, "Why do you not write these items into the Bill?" His answer was that it was possible that present conditions might change. Our transport position might much improve; we might get rid of the abnormal transport charges by coaster and by rail and in consequence get rid of the £3,000,000 subsidy which had been paid. In that case they would have to find other purposes to which to apply the money while this Bill remained in force. But if they could not write into the Bill the exact purposes which they had in view, he hoped they could write in a definition which would bind the Minister in finding other purposes, if the need arose. The levy which the Minister raised under the Coal Charges Order amounted to £50,000,000 a year. That Order laid it down that the Minister should use the money "in accordance with arrangements made by him and approved by the Treasury for any purpose connected with the production or marketing of coal." They had written those exact words into the Amendment which, if it were adopted, would insert them into Sub-section (3). They hoped that this might meet the Motion that was put down on Second Reading and that the language used to satisfy Parliament in respect of the use of £50,000,000 which the Minister of Fuel & Power controlled would equally satisfy Parliament in respect of this £500,000, since the purpose in both cases was identical.

Sir Joseph Lamb (Stone—C.): Will the Parliamentary Secretary make it clear that the payments to which he made reference and which are being made by the Minister of Fuel & Power are made out of revenue and not of capital?

Mr. Noel-Baker: This is coming out of current money which comes from revenue. The Amendment was agreed to, and the Clause as amended was passed.

The remaining Clauses and Schedules were agreed to, and the committee stage was concluded.

The Bill as amended was considered on report, and read the third time and passed.

Questions in Parliament

Trains between London and Glasgow

Mr. S. P. Viant (Willesden West—Lab.) on June 2 asked the Parliamentary Secretary to the Ministry of War Transport if he was aware that a special train, not shown in the public time-table, had been booked to run daily between London, Euston and Glasgow, St. Enoch, in each direction, leaving at 8.40 p.m., the train being composed of 12 vehicles weighing 437 tons empty, had accommodation for 60 first class sleeping passengers, 56 third class sleeping and 290 ordinary third class passengers; that 210 tons of the total weight was taken up by 60 first class passengers; and, as there was a sleeping

car train in each direction at 9.15 p.m., would he take steps to have such luxury travelling withdrawn.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary, Ministry of War Transport): It has been necessary, as a temporary measure, to provide these special trains, to cope with exceptionally heavy duty travel by service personnel and others. Any spare capacity available on any night is placed at the disposal of the railway.

Mr. Viant: Will the Parliamentary Secretary use his influence to see that this kind of travel is kept to a minimum?

Mr. Noel-Baker: Of course, we desire to keep it to a minimum, but this train is essential.

(See editorial note, page 574)

HEAVY FREIGHT (WAR STANDARD) BEYER-GARRATT LOCOMOTIVE

(Concluded from page 589)

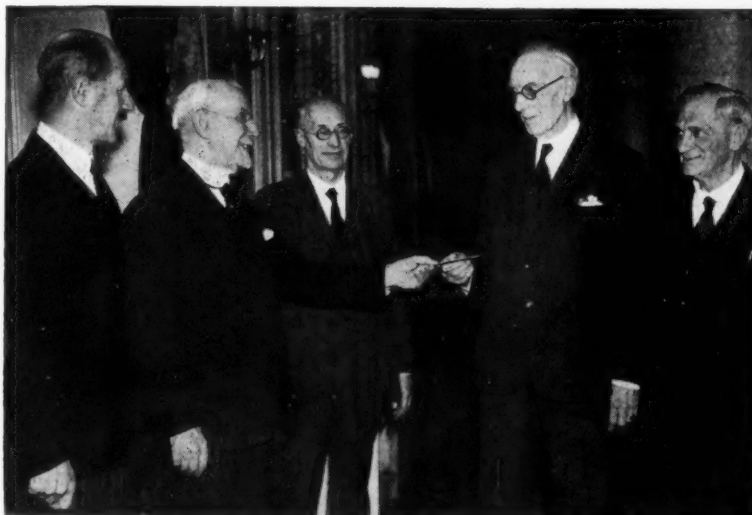
controlled by the latest S.J. type ejector with combined Mark IV graduable steam valve. A hand brake acts on the hind unit only. Gravity sanding operated by steam cylinder feeds the front and rear of each group of coupled wheels. The tanks are of specially robust construction and a large tunnel provides improved access to various details. Removable back plates on the front tank facilitate withdrawal of tubes.

The cab is very commodious and has the ample dimensions possible with this type of engine. Although of the closed type for travelling backwards, every attention has been given to providing the largest possible amount of ventilation for the tropics. The side entrance doors are in halves and arranged for fully closed, half open, and full open positions, and the large side lookouts are fitted with sliding windows. Large front windows on each side of the firebox ensure an excellent view for both driver and fireman. Large ventilators are also provided in the roof, which is double with asbestos insulation and air space. The latest type of

tunnel arrangement with folding doors provides access to the self-trimming bunker and ensures maximum comfort when travelling bunker first.

Special care has been given to the convenient location of all controls; the various valves are arranged in two steam turrets, located on the firebox outside to reduce heat in the cab. All controls, including the lubricator feeds, are clearly marked for their purpose. The firedoor is of the sliding type and provided with a driver's shield plate and top tray. Collapsible cushioned seats, with back and arm rests, are provided for the engine-men and there is also an Inspector's seat behind the driver, on the bunker plate, where there are also adequate tool boxes. The locomotives are equipped with four 25-ton jacks and two ramps. Stone's electric lighting is provided, with headlights at each end of the engine.

Great care has been taken to include in this war standard locomotive the latest experience in the design of details of this type of engine to ensure efficient working and the least maintenance, but space does not permit more detailed reference.



On May 20, Mr. D. A. Bremner, whose retirement from the Directorship of the British Engineers' Association was recorded in our May 7 issue, received a presentation from Sir William Reavell. Left to right: Lt.-Colonel Lord Dudley Gordon (past President); Sir William Reavell (past President); Mr. Cecil Bentham (President); Mr. D. A. Bremner; and Mr. Joseph J. Carter (immediate past President)

Notes and News

Cost-of-Living Index.—The official cost-of-living index figure on May 1 was 99 points above the level of July, 1914, compared with 98 points on April 1 last. In May, 1938, it was 56 points, and in May, 1939, 53 points, above the level of July, 1914.

Nitrate Railways Co. Ltd.—The directors recommend a dividend of 1½ per cent. actual for 1942 on the ordinary and preferred ordinary shares, or 2s. 6d. a share, the same as for each of the four preceding years. Net profit is £49,203 after charging £16,984 for exchange differences.

New Spanish Road Bridge.—A new road bridge, named Puente del Pedrido, between La Coruña and El Ferrol, was officially opened on April 15. The bridge is 1,706 ft. long, and consists of 13 arches of reinforced concrete each with a clear width of 105 ft. The bridge is stated to have cost pesetas 3,700,000.

Argentine Public Works Estimates.—The Argentine programme of public works for 1943 provides for a total expenditure of approximately 225,000,000 pesos (£13,500,000). Of this sum, 153,238,270 pesos have been allocated to the State Railways, port works, and other items, and 3,750,000 pesos to provincial road construction.

French Eastern Railway.—The net profit for 1942 of the Chemin de Fer de l'Est amounted to fr. 3,600,000 (against fr. 3,700,000 for 1941), in addition to the allocations from the Société Nationale des Chemins de Fer Français. This enabled the company to pay a dividend of 8.4 per cent. (the same as for 1941) on its share capital of fr. 292,000,000.

Line Closed in Ceylon.—The section north of Bangadeniya of the broad-gauge line from Colombo to Puttalam, Ceylon Government Railway, has been closed. Stations between Bangadeniya and Puttalam are being used only for the receipt and dispatch of parcels and goods, arrangements for the carriage of which by road have been made. Charges are being levied at the usual rates by the railway administration, which is responsible for the road services. It is stated that the closed portion of the line will be dismantled.

Antofagasta Debenture Redemption.—The directors announce that £50,000 of the outstanding 5 per cent. debenture stock will be redeemed by drawing at par, plus three months' interest, on October 1 next. Holders will be given three months' notice. The stock was repayable at 125 per cent. on January 1 last, but only the 25 per cent. premium was then paid in cash. Holders had in December, 1942, agreed to a scheme providing for the payment of this premium and for postponement of the redemption of the principal for ten years subject to an annual charge on account of redemption.

Entre Rios Railways Win Lawsuit.—The Argentine Supreme Court has confirmed the judgment previously given by a lower court in an action brought against the Entre Rios Railways Co. Ltd. for the collection of 3,000 pesos in respect of internal revenue taxes on a consignment of petrol imported by the railway for its own use. In its defence, the company invoked Law No. 5,315 (Mitre Law), and the Elucidatory Law No. 10,657, which exempted it from the payment of all taxes; this view had been accepted by the customs authorities, who allowed it to import the fuel duty free. This was confirmed by the Supreme Court, which pointed out that if

the customs, a department of the Ministry of Finance, had held that the petrol was duty free, it was illogical for another department of the same Ministry to declare that the petrol was taxable. The Supreme Court also pointed out that the relevant laws had always been interpreted in that sense.

Permanent Way Institution.—By the courtesy of Mr. W. K. Wallace, Chief Civil Engineer, L.M.S.R., members of the Manchester & Liverpool Section will be able to visit the concrete depot; the district engineer's workshops; the plant depot; and the bridge shop at Newton Heath on June 12. The President, Mr. V. A. M. Robertson, M.C., Engineer-in-Chief, L.P.T.B., will be present. Members are asked to assemble at Newton Heath Depot by 2.30 p.m.

Oxford Transport Trust Limited.—The British Electric Traction Company is largely interested in this company which, jointly with the Great Western Railway Company, controls the City of Oxford Motor Services Limited. Profit of the Oxford Transport Trust for the year ended March 31, 1943, was £15,985, to which must be added £11,109 brought forward, making a total of £27,094. Dividend for the year is 11 per cent., less tax, and the amount to be carried forward is £13,618.

Canadian National Railways.—Gross earnings during April last were \$38,444,000, an increase of \$10,128,000 in comparison with April, 1942, and the operating expenses of \$29,110,000 showed an advance of \$7,872,000, so that net earnings were \$2,256,000 higher at \$9,334,000. Aggregate gross earnings, January 1 to April 30, 1943, amounted to \$134,151,000, an increase of \$26,212,000 over the first four months of 1942, and the net earnings of \$26,814,000 were \$4,511,000 higher.

Canadian Pacific Railway.—For the month of April, 1943, gross earnings were \$24,046,000, an increase of \$3,424,000 in comparison with April, 1942. Working expenses advanced from \$17,066,000 to \$20,255,000 and the net earnings of \$3,791,000 showed an improvement of \$235,000. Aggregate gross earnings for the first four months of 1943 amounted to \$87,329,000, or \$9,063,000 more than for the corresponding period of 1942 but the net earnings of \$12,468,000 were \$1,072,000 lower.

Canadian Transcontinental Air Line.—On Sunday last, June 6, the main-line service of Trans-Canada Air Lines was extended to Victoria, British Columbia, in order to expedite the transport of mail, express goods, and passengers. Hitherto the service has terminated at Vancouver. The extension to Victoria (Vancouver Island) increases to 3,911 miles the length of the transcontinental route, making it the longest of its kind on the American continent. Reference to this impending extension was made in the leader in our May 28 issue (page 528).

Beyer, Peacock & Co. Ltd.—Trading profit for the year 1942, after charging taxation and contingencies, was £65,240 (£75,387), and gross profit was £70,915 (£81,045). After debenture interest and other charges and appropriating £13,500 (same) to reserve for depreciation, there was a net profit of £38,008 (£51,283). In 1941 the amount brought in was £99,571, but the amount carried forward was reduced to £18,104 by a provision of £75,000 for E.P.T. from April 1, 1939, to December 31, 1941, and by the payment of further arrears of dividend on the £300,000 of 5½ per cent.

cumulative preference shares, bringing the payment up to June 30, 1934. A payment in respect of arrears of dividend to June 30, 1935, was made on July 21, 1942, and one in respect of the year to June 30, 1936, was made on January 21, 1943.

Phillimore Railway Collection.—We are officially advised that the sale by auction of this collection, by Messrs. Sotheby & Company, on Tuesday, realised a total of £3,366 19s.

Companhia de Mocambique.—An extraordinary general meeting has been convened for 5 p.m. on June 11 at this

British and Irish Railway Stocks and Shares

Stocks	Highest 1942	Lowest 1942	Prices	
			June 4, 1943	Rise/Fall
G.W.R.				
Cons. Ord.	58	39	61½	- ½
5% Con. Pref.	115½	105½	114	—
5% Red. Pref. (1950) ..	109½	103½	108	—
5% R. Charge	133½	123½	129	—
5% Cons. Guar.	130½	121½	126½	- 1
4% Deb.	117	105	110	+ ½
4½% Deb.	118	108	111½	—
4½% Deb.	125	113	119½	—
5% Deb.	137	127	131	—
2½ Deb.	77	70	76	—
L.M.S.R.				
Ord.	28½	16½	31½	- ½
4% Pref. (1923)	63½	50½	62½	- ½
4% Pref.	76½	67½	76	- ½
5% Red. Pref. (1955) ..	103½	94½	104½	—
4% Guar.	104½	97½	105	+ ½
4% Deb.	108½	101½	105	—
5% Red. Deb. (1952) ..	111	107½	109½	—
L.N.E.R.				
5% Pref. Ord.	9½	2½	10½	- ½
Def. Ord.	5	1½	4½	- ½
4% First Pref.	62	49½	62½	- ½
4% Second Pref.	32½	18½	34	- ½
5% Red. Pref. (1955) ..	95½	79	97½	+ ½
4% First Guar.	98	88	97	+ ½
4% Second Guar.	90	78	90	—
3% Deb.	85	76	80	+ ½
4% Deb.	106½	100½	104	—
5% Red. Deb. (1947) ..	106	103	104½	—
4½ Sinking Fund Red. Deb.	104	102½	106½	—
SOUTHERN				
Pref. Ord.	77	61½	75	- 1
Def. Ord.	23½	14½	24½	- ½
5% First Pref.	112½	104	112	—
5% Red. Pref. (1964) ..	108½	105	112½	—
5% Guar. Pref.	131	121½	126½	- 1
5% Red. Guar. Pref. (1957) ..	115½	109½	114	—
4% Deb.	116	104½	108	+ ½
5% Deb.	134	125½	131½	—
4% Red. Deb. (1962-67) ..	110½	106	108½	—
4% Red. Deb. (1970-80) ..	111	106½	108½	—
FORTH BRIDGE				
4% Deb.	109½	108	106	—
4% Guar.	105½	100	104½	—
L.P.T.B.				
4½ "A"	122½	111	116½	- 1
5% "A"	131½	122	126½	- 1
3% Guar. (1967-72) ..	95½	97½	99	- 1
5% "B"	121	111½	116½	- 1
"C"	56½	38	61½	—
MERSEY				
Ord.	27½	20½	30½	+ 1
3% Perp. Pref.	61½	56½	61	—
4% Perp. Deb.	102½	99½	104	—
3% Perp. Deb.	80½	76	79	—
IRELAND				
BELFAST & C.D.				
Ord.	9	4	9	—
G. NORTHERN				
Ord.	29½	12½	19	- ½
G. SOUTHERN				
Ord.	25	10	10	+ ½
Pref.	29	12½	13	—
Guar.	53	35½	30½	+ ½
Deb.	71½	55½	55½	- 2½

§ ex-dividend

OFFICIAL NOTICES

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

company's offices, at 10, Largo da Biblioteca Publica, Lisbon. The meeting is being called for the purpose of altering or replacing Articles 2, 12, 13, 14 (and its paragraphs), 19, 20, 22, and 25 of the company's Statutes and of deleting or replacing the transitional Articles 29, 30, and 31. Article 18 provides that resolutions relating to any alteration of the Statutes shall be valid only when passed by a meeting at which two-thirds of the company's capital is represented. If this condition is not fulfilled at the first meeting, another meeting will be convened.

North British Locomotive Co. Ltd.

The report for the year 1942 shows that the profit, after providing for depreciation, was £228,349 (£220,409). Deduct provision for taxation £150,000 (£120,000), and provision for reserve £50,000 (same), leaving £28,349. Adding £59,296 brought forward makes a total available of £87,645. Dividends on the preference stock for the year, less tax, require £18,750, and the directors, as already announced, propose a dividend on the ordinary stock of 3 per cent., less tax. This will absorb £18,750, leaving £50,145 to be carried forward. The works have been fully employed throughout the period under review.

Yorkshire Bus Strike.—After being on strike for 22 days, more than 1,000 drivers, conductors, fitters, and cleaners of the Yorkshire Traction Co. Ltd. at Barnsley, Huddersfield, Doncaster, and other depots, resumed work on June 3. This was the most lengthy of the various bus strikes which resulted from the rejection by the arbitration tribunal of the claim for higher wages and better conditions. As a new national claim is being lodged, the strikers decided to resume work, to facilitate negotiations. The Yorkshire Traction strike began on Wednesday, May 12, and from two days later military transport was provided for essential workers, as noted in our June 4 issue, page 550.

Presentations to Southern Railway Staff.—At the headquarters offices of the London (East) Divisional Superintendent, Southern Railway, on May 29, presentations of diplomas were made to eleven members of the staff who have performed 50 years' service, nine in the Traffic Department, and two in the Locomotive Department. The presentations were made to the former by Mr. P. Nunn, London (East) Divisional Superintendent, and to the latter by Mr. D. Sheppy, Eastern Divisional Locomotive Running Superintendent. Mr. Nunn was supported by Messrs. J. C. Dann, Senior Assistant, G. Cheal, Chief Clerk, F. Blackburn, Acting Assistant to Superintendent, and A. Stickels, Chief Staff Clerk; and Mr. Sheppy was supported by Mr. Lelew, Assistant, and Mr. Howard, Running Shed Superintendent, Bricklayers Arms. Mr. Nunn said that a number of the recipients

No. 528,102 "Improvements in Friction Units or Snubbers, particularly for Railway Trucks"

THE owners of the above patent are desirous of arranging by licence or otherwise on reasonable terms for the manufacture and commercial development of the invention. For particulars address in the first instance to Herbert Haddan & Co., 31 and 32 Bedford Street, Strand, London, W.C.2.

had taken an active part in the transport of troops from the Channel Ports on arrival from Dunkirk, and that it was a coincidence that the presentations were made two days after the anniversary of the evacuation. Mr. Sheppy said that the two locomotive men had performed sterling work throughout their careers. Mr. Card, Stationmaster, London Bridge, replied on behalf of the recipients, who, in addition to Mr. Card, were Messrs. Windsor, formerly Signalman, Sittingbourne; Glover, Signalman, Ashford; Russ, Area Inspector, London (East) Divisional Superintendent's Office; Payne, Passenger Guard, Maidstone West; Needham, Signalman, Dartford; Smithson, leading Parcels Porter, Cannon Street; Barnes, Goods Guard, Rotherhithe Road; Fisher, Station Foreman, Bromley South; and Evans and Perry, Drivers, Bricklayers Arms.

British Electric Traction Co. Ltd.

Preliminary figures show that revenue for the year ended March 31, 1943, amounts to £760,293 (£767,588). After deducting general expenses, etc., and debenture stock interest, and after providing £51,553 for income tax, there is a profit (subject to audit) of £569,394 (£527,393). The directors recommend final dividends, subject to tax, of 5 per cent. on the participating preference stock, making 8 per cent. for the year; 4 per cent. on the preferred ordinary stock; making 8 per cent. for the year; and 30 per cent. on the deferred ordinary stock, making 45 per cent. for the year, and leaving £50,435 to be transferred to undivided profits account. Reserves for E.P.T. provided out of past profits and amounting in total to £170,000 are no longer required and have been transferred to undivided profits account.

Presentation of Mobile Kitchen to G.W.R.—At West London Carriage Sidings on June 1, Lt.-Colonel D. C. Unwin Simson, representing the High Commissioner for Canada, presented to Mr. H. J. Bentley, Chairman of the Main-Line Railway Canteens Association, a mobile trailer kitchen, which has been allocated to the Great Western Railway, the forty-third to be given to the workers of Britain by the citizens of Guelph and Wellington County, Ontario, through the good offices of the *Guelph Daily Mercury* Fund. In expressing the thanks of the G.W.R. and the Main-Line Railway Canteens Association, Mr. G. E. Orton, Public Relations Officer, G.W.R., said that it was one more example of the wonderful contribution Canada was making to the war effort. It was being recognised more and more by the public that the part the railways were playing in the war effort was vital to its successful prosecution. No-one could work without food, and the good citizens of Guelph and Wellington County had seen to it that railwaymen should have it presented to them in an attractive form through the medium of the

Now on Sale**Universal Directory of Railway Officials and Railway Year Book**

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very fine canteen. Appreciation and thanks were expressed also by Mr. M. Pounder, National Union of Railwaymen; Mr. J. R. P. Postlethwaite, London Divisional Food Officer; Captain J. A. L. Duncan, M.P. for North Kensington; and the Mayor of Kensington.

Contracts and Tenders

The Peruvian Corporaion has placed an order with Davies & Metcalfe Limited for an exhaust steam injector for the Central Railway of Peru.

The following orders have been placed recently by the Egyptian State Railways:—

Pilkington Bros. Ltd.: Glasses.
Ericsson Telephones Limited: Jacks, rings, coil induction, labels, heat coils, telephone and telegraph materials, switchboard spare parts.
British Insulated Cables Limited: Wire cable.
Bells Asbestos & Engineering Supplies Limited: Asbestos.
Phoenix Telephone & Electric Works Limited: Receiver insets.
J. Stone & Co. Ltd.: Accumulators, tin ingots.
G. Angus & Co. Ltd.: Hose flax canvas.
Turrett Grinding Wheel Co. Ltd.: Grinding wheels.
W. T. Henley's Telegraph Works Co. Ltd.: Cable.
Waterlow & Sons Ltd.: Blank cards for tickets.
T.N. Stores Depot: Flat bars.
British Patent Perforated Paper Co. Ltd.: Toilet paper.
Docker Brothers: Paints.
Lewis Berger & Sons Ltd.: Dry colours for oils, enamel, etc.
Bourne Chemical Industries Limited: White lead.
Sissons Bros. & Co. Ltd.: Red paint.
Colthurst & Harding Limited: Dry colours for oils.
Geo. Salter & Co. Ltd.: Steel springs.
I.C.I. (Paints) Limited: Paints.
Consolidated Pneumatic Tool Co. Ltd.: Pneumatic material and spares.
C. D. Monninger Limited: Endless band-saws.
Denton & Best: Cast steel.
W. F. Rhodes & Co. Ltd.: Brown shellac.
Broughton Copper Co. Ltd.: Tubes.
West Bromwich Spring Co. Ltd.: Volute buffer springs.
Bullers Limited: Combiners arm.
Bayliss, Jones & Bayliss Limited: Spindles, screwspikes.
Union Oxide & Chemical Co. Ltd.: Prussiate of potash.
Siemens Electric Lamps & Supplies Limited: Electric lamps, cable.
Liverpool Electric Cable Co. Ltd.: Flexible copper cable.
Bruntons (Musselburgh) Limited: Banding wire.
General Electric Co. Ltd.: Ammeters.
Sherwoods Limited: Burners, flame spreaders.
Morgan Crucible Co. Ltd.: Crucibles.
British Tabulating Machine Co. Ltd.: Ribbon for calculating machines.
Potter, Cowan & Co. Ltd.: Copper joints.
R. Hood Haggie & Son Ltd.: Wire ropes.
Tubes Limited: Pipes and tubes.

Railway Stock Market

Stock Exchange markets remained inactive, but the undertone was steadier in most sections, and sentiment was assisted by the moderate amount of selling in evidence. The chief feature was provided by a widespread advance in Argentine railway securities; the political changes in the Argentine have led to hopes that there may now be better prospects of the railways receiving more equitable treatment from the authorities in that country. Due to the fact that some stocks were not in more than moderate supply in the market, the improved demand on Monday was smaller than might have been deduced from the gains shown. Subsequently, there was a partial reaction, but this was in evidence more in the ordinary stocks than in the preference and debenture stocks. At the time of writing, gains of up to 2½ points have been recorded in the latter. In any event it would seem that there is little prospect of the ordinary stocks of leading Argentine railway companies returning to the dividend list until after the war, when the reconstruction of Europe will no doubt lead to exceptionally large demand for Argentine products. Nevertheless, many holders of the ordinary stocks are prepared to take a hopeful view of the future; moreover, these stocks also attract speculative attention because they move closely with developments affecting the position of the railways, and

judging from past experience, are also likely to tend to discount the future a long way ahead.

Home railway junior stocks again declined on balance, but at the time of writing the lower prices appear to be attracting buyers. The very generous yields are generally recognised, but it appears doubtful if there is likely to be any strong recovery in these stocks until markets become active. It seems unlikely this year that the interim dividends will be an important market factor because the prevailing belief is that they will be the same as the corresponding payments last year. If it were possible to make any increase this would probably be left until the final payments. Current views, however, are that, bearing in mind the annual rental under the financial agreement, it is unlikely that any improvement in dividend payments can be expected. There should be, of course, every possibility of last year's dividends being repeated. In some quarters there is talk of a fractional improvement in the payment on L.N.E.R. second preference. Prior charges were maintained around the same levels as a week ago; the tendency was to await further improvement in gilt-edged securities.

The high-class investment merits of home railway prior charges probably have been increased by the rental agreement,

because so long as the latter is in force their interest payments can be considered as being, in effect, guaranteed by the Government.

Compared with a week ago, Great Western ordinary was fractionally lower on balance at 61½; the debentures were slightly better at 110, and the 5 per cent. preference was unchanged at 113½. L.M.S.R. ordinary was 32½, compared with 32½ a week ago, the senior preference 76, compared with 76½, and the 1923 preference at 62½ was unchanged on balance. L.M.S.R. guaranteed held its recent improvement to 100½. L.N.E.R. first guaranteed also maintained last week's rally to 97½; the first preference was unchanged at 62½, and now has the same quotation as L.M.S.R. 1923 preference. L.N.E.R. second preference moved back from 34½ to 34. Southern deferred eased from 24½ to 24½; the preferred declined from 75½ to 74½. London Transport "C" at 61½ was unchanged on balance.

At the time of writing the widespread gains in Argentine railway securities have included a rise to 13½ in B.A. Gt. Southern ordinary and a gain of two points to a similar figure in B.A. Western ordinary. Central Argentine preference stocks gained two points on Monday. Elsewhere, San Paulo ordinary was 69. Fractional movements were shown in Canadian Pacifics.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ending	Traffic for week		No. of Weeks	Aggregate traffic to date			Shares or stock	Prices						
			Total this year	Inc. or dec. compared with 1941/2		Totals		Increase or decrease		Highest 1942	Lowest 1942	June 4 1943	Yield % (See Note)			
						1942/3	1941/2									
South & Central America	Antofagasta (Chili) & Bolivia	834	30.5.43	£ 33,960	+	£ 6,840	22	£ 597,370	£ 464,910	+	£ 132,460	Ord. Stk.	14	7½	13½	Nil
	Argentine North Eastern	753	29.5.43	33,056	+	552	48	592,914	519,312	+	73,602	Ord. Stk.	6½	3	6½	Nil
	Bolivar	174	Apr., 1943	5,550	+	1,220	16	21,881	18,458	+	3,423	6 p.c. Deb.	19½	10	20½	Nil
	Brazil	—	—	—	—	—	—	—	—	—	—	Bonds	20½	9	22½	Nil
	Buenos Ayres & Pacific	2,807	29.5.43	92,040	+	2,460	48	4,786,680	4,210,260	+	577,420	Ord. Stk.	7½	4	6½	Nil
	Buenos Ayres Great Southern	5,080	29.5.43	148,740	+	7,860	48	7,724,820	7,038,160	+	686,160	Ord. Stk.	12½	7½	12	Nil
	Buenos Ayres Western	1,930	29.5.43	48,780	+	8,940	48	2,594,520	2,475,660	+	118,860	Ord. Stk.	12½	6	11½	Nil
	Central Argentine	3,700	29.5.43	123,660	+	8,244	48	6,295,668	5,060,442	+	1,235,226	Ord. Stk.	9½	4½	8½	Nil
	Do.	—	—	—	—	—	—	—	—	—	—	Div.	3½	2½	4	Nil
	Cent. Uruguay of M. Video	972	29.5.43	39,906	+	10,127	48	1,413,782	1,223,443	+	190,339	Ord. Stk.	8	4	6½	Nil
	Costa Rica	262	Apr., 1943	18,009	+	6,463	44	150,966	212,569	—	61,603	Ord. Stk.	16½	11	15	Nil
	Dorada	70	Jan., 1943	6,000	+	3,530	4	—	—	—	—	1 Mt. Ob.	90	89	94½	6½
	Entre Rios	806	29.5.43	16,698	—	1,374	48	846,912	746,232	+	100,680	Ord. Stk.	33	4½	7	Nil
	Great Western of Brazil	1,030	29.5.43	12,900	+	3,600	21	341,500	222,200	+	119,300	Ord. Sh.	9½	9½	52/6	Nil
	International of Cl. Amer.	794	Apr., 1943	\$643,460	+	\$92,059	16	\$2,665,812	\$2,597,912	+	\$67,900	Ord. Sh.	—	—	—	Nil
South & Central America	Interoceanic of Mexico	—	—	—	—	—	—	—	—	—	—	1st Pref.	1½	5/3	2	Nil
	La Guaira & Caracas	22½	May, 1943	9,520	+	3,555	20	45,395	32,135	+	13,260	5 p.c. Deb.	11½	5	83½	Nil
	Leopoldina	1,918	22.5.43	31,861	+	3,775	20	657,859	606,751	+	51,108	Ord. Stk.	6½	3½	6½	Nil
	Mexican	483	21.5.43	ps. 335,400	+	ps. 10,900	19	ps. 7,224,600	ps. 7,012,900	+	ps. 211,700	Ord. Stk.	1	—	1½	Nil
	Midland Uruguay	319	Mar., 1943	18,039	+	2,103	36	134,739	123,127	+	11,612	Ord. Stk.	—	—	—	Nil
	Nitrato	382	31.5.43	6,889	—	2,002	19	62,039	63,766	—	1,727	Ord. Sh.	77½	3½	82½	Nil
	Paraguay Central	274	28.5.43	\$4,476,000	+	\$ 983,000	48	\$196,337,000	\$171,814,000	+	\$24,523,000	Pr. Li. Stk.	53	40	52½	11½
	Peruvian Corporation	1,059	Apr., 1943	89,811	+	9,084	40	847,392	752,443	+	4,949	Pref.	19½	5½	15½	—
	Salvador	100	Mar., 1943	£ 140,000	+	£ 14,000	38	£ 912,000	£ 782,172	+	£ 129,828	Ord. Stk.	59	41	69	23½
	San Paulo	153½	23.5.43	45,300	+	6,960	21	764,870	733,959	—	30,911	Ord. Sh.	41½	23½	32/6	Nil
	Talca	160	Apr., 1943	2,470	—	2,735	21	43,816	44,220	—	404	Ord. Sh.	8½	2½	6½	Nil
	United of Havana	1,301	29.5.43	49,892	+	17,154	48	2,455,466	1,523,539	+	931,927	Ord. Stk.	—	—	—	Nil
	Uruguay Northern	73	Mar., 1943	1,591	+	461	39	12,659	11,090	+	1,569	—	—	—	—	Nil
Canada	Canadian Pacific	17,034	31.5.43	1,647,200	+	309,400	21	22,306,800	19,957,600	+	2,349,200	Ord. Stk.	16½	9½	16½	Nil
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Nil
India	Barsi Light	202	Jan., 1943	22,440	+	10,612	42	172,958	135,863	+	37,095	—	—	—	—	Nil
	Bengal & North Western	2,090	Nov., 1942	264,975	—	33,087	8	449,400	561,082	—	111,682	Ord. Stk.	102½	88	102½	3½
	Bengal-Nagpur	3,267	Feb., 1943	932,775	—	84,975	46	10,031,400	9,111,000	+	920,400	—	105½	87	107½	6½
	Madras & Southern Mahratta	2,939	10.3.43	269,025	+	43,993	47	8,175,789	6,903,392	+	1,272,397	—	—	—	—	Nil
	Rohilkund & Kumaon	571	Nov., 1942	555,750	+	5,072	8	115,950	99,909	+	16,041	—	—	—	—	Nil
Various	South Indian	2,402	10.1.43	166,555	+	778	39	4,928,736	4,148,309	+	780,427	—	103½	88½	102½	4½
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Nil
	Egyptian Delta	607	20.4.43	14,202	+	3,470	43	28,416	20,917	+	7,499	Prf. Sh.	54	1½	4	Nil
	Manila	—	—	—	—	—	—	—	—	—	—	B. Deb.	44	35	36	9½
	Midland of W. Australia	277	Mar., 1943	33,862	+	15,274	36	286,570	177,483	+	109,087	Inc. Deb.	95	90	98	6½
Various	Nigerian	1,900	27.2.43	72,670	—	24,705	46	3,262,161	2,894,620	+	367,541	—	—	—	—	Nil
	South Africa	13,291	24.4.43	807,564	+	22,419	3	2,932,228	2,642,471	+	289,757	—	—	—	—	Nil
	Victoria	4,774	Jan., 1943	1,480,058	+	169,521	—	—	—	—	—	—	—	—	—	Nil

Note. Yields are based on the approximate current prices and are within a fraction of ½
† Receipts are calculated @ 1s. 6d. to the rupee

Argentine traffic is given in sterling calculated @ 16½ pesos to the £
§ ex dividend